THE JOURNAL
of the American Medical Association
Published Under the Auspices of the Board of Trustees
VOL. 157, NO. 16 CHICAGO, ILLINOIS APRIL 16, 1955
COPYRIGHT, 1955, BY AMERICAN MEDICAL ASSOCIATION

CITRIC ACID INTOXICATION

John P. Bunker, M.D., John B. Stetson, M.D., Robert C. Coe, M.D., Hermes C. Grillo, M.D.
and
Anna J. Murphy, B.S., Boston

Ten years ago the possibility of clinical citric acid intoxication during the transfusion of citrated blood was thought to be negligible.[1] Shortly thereafter the development of exchange transfusion techniques, with the replacement of two or three times an infant's (or adult's) blood volume, brought attention to this problem again. Wexler and co-workers[2] and Ames, Syllm, and Rapoport[3] demonstrated high concentrations of serum citrate during the administration of moderate to large amounts of citrated blood and plasma to infants. In each of these investigator's groups of cases there was a death for which citric acid intoxication may have been responsible. More recently, the development of new medical and surgical methods of treating bleeding esophageal varices in patients with portal hypertension and the development of bold techniques in the surgery of the heart and major vessels have created new possibilities for citrate toxicity to develop. To study this problem we have measured levels of serum citrate, calcium, total protein, and magnesium; from these we have calculated the level of serum ionized calcium. We have, in addition, made preliminary observations of the effect of depressed ionized calcium on cardiac function and on the clotting mechanism. From the results of these studies it is clear that clinical citric acid intoxication can and does occur; it occurs during multiple transfusions of citrated blood in patients with liver disease or with mechanical obstruction to hepatic circulation and in any patient, with or without liver disease, during extremely rapid and prolonged transfusions of citrated blood.

METHODS

Clinical Material and Collection of Samples.—The data were collected from September, 1952, to June, 1954. During this time we attempted to study all patients, both surgical and medical, who received transfused blood in large volumes. For practical reasons not more than half could be studied, but the patients were as unselected as we could make them and should represent a fair cross section of those who had multiple transfusions in this hospital. For comparison, studies were made of various patients receiving more modest transfusions of 1,000 to 2,000 cc. A total of 130 patients were studied. Moderate to advanced liver disease was present in 41 patients; of these, 32 were bleeding from esophageal varices or were undergoing an interval portacaval or splenorenal anastomosis for relief of portal hypertension. Among the remaining cases, there were 12 gastrectomies, 11 aortic resections and grafts, 8 craniotomies, 5 pelvic exenterations, 5 Wertheim hysterectomies, 3 esophagectomies, 3 nephrectomies, 2 pulmonary resections, 5 cases of severe trauma, and 6 miscellaneous abdominal procedures.

The citrated whole blood that these patients received came from the blood bank of the Massachusetts General Hospital or the American Red Cross. Each unit of blood from the Massachusetts General blood bank contained 75 cc. of an acid-citrate-dextrose solution of 1.33% sodium citrate, 0.47% citric acid, and 3.0% dextrose. Each unit of Red Cross blood contained 125 cc. of a solution of 1.33% sodium citrate, 0.47% citric acid, and 1.47% dextrose. Arterial blood samples were usually drawn from an inlying Cournand needle in the radial or brachial artery. Occasionally venous blood was used, care being taken to use an extremity away from the site of the intravenous blood transfusion. In tables 2, 3, and 4 samples not arterial are so indicated.

Chemical Determinations.—Serum citrate levels were determined in the earlier cases by the method of Taussky

From the Anesthesia Laboratory of the Harvard Medical School at the Massachusetts General Hospital.
This study was supported in part by a grant from the Medical Research and Development Board of the U. S. Army and in part by a grant from Mr. Edward Mallinckrodt.

Owing to space limitations, bibliographic references 4 to 8 have been omitted from THE JOURNAL but will be included in the authors' reprints.

Drs. Claude A. Villee, John G. Gibson II, and Mario Stefanini gave advice on biochemical and hematological problems in this study. Mrs. Patricia Osgood and Mrs. Anne Hurley gave technical assistance.

1. Allen, J. G.; Clark, D. E.; Thornton, T. F., Jr., and Adams, W. E.: The Transfusion of Massive Volumes of Citrated Whole Blood in Man: Clinical Evidence of Its Safety, Surgery **15**: 824-831 (May) 1944.
2. Wexler, I. B.; Pincus, J. B.; Natelson, S., and Lugovoy, J. K.: III. Fate of Citrate in Erythroblastotic Infants Treated with Exchange Transfusion, J. Clin. Invest. **28**: 474-481 (May) 1949.
3. Ames, R.; Sylim, I., and Rapoport, S.: Effect of Infusions of Citrated Plasma on the Plasma Citrate Level of Infants. Pediatrics **6**: 361-370 (Sept., pt. 1) 1950.

and Shorr[4] and more recently by Elliott's modification of the method of Natelson, Pincus, and Lugovoy.[5] Serum calcium levels were determined by the gravimetric method of Fiske.[6] The possibility that an elevated serum citrate level might interfere with the determination of calcium, as suggested by Wexler,[2] was tested by adding concentrations of citrate ion of 60, 30, and 15 mg. per 100 cc. to two separate serum pools. The determined calcium of these pools agreed within 0.1 mg. per 100 cc. of control values at citric acid levels of 15 and 30 mg. per 100 cc. and within 0.2 and 0.3 mg. at levels of 60 mg. per 100 cc. Total protein was calculated from the optical density at 280 mμ determined in a Beckman model DU spectrophotometer.[7] The serum magnesium level was determined by the method of Garner[8] and the serum potassium level with the Beckman flame photometer. Serum citrate and total calcium levels are reported in milligrams per 100 cc. and serum potassium in milliequivalents per liter to conform with common usage. The calculated ionized calcium is expressed in millimoles per liter to conform with the classical and fundamental studies of McLean and Hastings.[9]

Calculations.—The serum ionized calcium level was calculated to the nearest 0.05 mM. per liter from total calcium, citrate, and total protein by use of the nomograms of McLean and Hastings[9] in successive approximations until both nomograms were satisfied simultaneously. The values obtained could then be verified in the original equations. The serum magnesium level, although measured, was disregarded in the calculations, since even in the patients with the greatest changes in citrate and calcium a consideration of magnesium was found to alter the calculated ionized calcium less than 0.05 mM. per liter. Change in serum pH was similarly disregarded, for the pK values of calcium citrate and of calcium proteinate are well outside of the maximum observed pH range of 7.50 to 7.10. The maximum pH change we observed would result in a change in the concentration of ionized calcium only in the third decimal place. Inorganic phosphorus was also not considered for similar reasons, since phosphate cannot combine with ionized calcium at a pH of less than 10. The isoelectric points of both albumin and globulin are very low and in the same range; hence differences in the albumin-globulin ratio will not materially affect the binding of calcium by plasma protein. Therefore, changes in albumin-globulin ratio were not considered in the estimation of ionized calcium from total calcium, total protein, and serum citrate.

RESULTS

Thirty-three normal adult patients who had major surgery and received multiple transfusions at a rate of not more than about 500 cc. every 30 minutes gave no evidence of citric acid intoxication. Thus, if the rate at which citrate was infused remained below 0.5 mg. per kilogram of body weight per minute, the serum concentration of citrate ion remained below 9 mg. per 100 cc. (0.5 mM. per liter) and the calculated ionized calcium level remained above 0.85 mM. per liter, which is within the normal range (table 1). Nineteen of the patients received transfusions of 2,000 cc. or more of whole blood, and five received more than 3,500 cc. This group of patients corresponds closely, both in type of surgery and volume of transfused blood, to the series of cases reported by Allen and co-workers in 1944.[1] Our data confirm their observation that transfusions of moderately large volumes of citrated blood can be given to normal patients with clinical safety. Fifteen patients with advanced liver disease receiving whole blood transfusions at about the same rate (less than 0.5 mg. per kilogram per minute) had higher serum citrate levels (consistent with the known poor citrate tolerance of patients with liver disease[10]). The serum citrate level rose above 9 mg. per 100 cc. in 9 of the 15 patients, and in 5 of those 9 the calculated ionized calcium level fell below 0.8 mM. per liter (tables 1 and 2). Transfusions in this group were given in the emergency treatment of bleeding esophageal varices and during shunt surgery for the re-

TABLE 1.—*Comparison of Elevation in Serum Citrate Level at Varying Rates of Infusion of Citrated Whole Blood*

Range, Mg./Kg./Min.	No. of Patients	Average Total Infused Citrate, Mg./Kg./ Patient	Average Rate of Infusion Citrate, Mg./Kg./ Min.	Mean ± Standard Error: Serum Citrate, Mg./100 Cc.	Total Protein, Gm./100 Cc.	Total Calcium, Mg./100 Cc.	Calculated [Ca++], mM./Liter	Serum Potassium, mEq./Liter	Serum Magnesium, mEq./Liter
No liver disease									
Preoperative, with premedication	19	..	....	2.0 ±0.19	6.1 ±0.16	8.8 ±0.19	1.0 ±0.03	4.0 ±0.05	1.8 ±0.08
0.1-0.5	18	58	0.28	5.0 ±0.38	6.3 ±0.17	8.7 ±0.19	0.93 ±0.02	4.1 ±0.22	1.9 ±0.10
0.6-1	14	100	0.70	9.0 ±1.01	6.1 ±0.22	8.5 ±0.29	0.88 ±0.03	4.2 ±0.23	1.8 ±0.07
Over 1	12	83	2.2	16.6 ±2.9	5.8 ±0.13	8.3 ±0.15	0.78 ±0.05	4.3 ±0.17	1.9 ±0.14
Liver disease									
Preoperative, with premedication	5	..	....	3.2 ±0.53	6.6 ±0.45	8.1 ±0.33	0.89 ±0.06	4.1 ±0.24	2.0 ±0.22
0.1-0.5	13	59	0.31	8.4 ±0.69	6.4 ±0.27	8.5 ±0.17	0.87 ±0.03	4.6 ±0.22	1.9 ±0.15
0.6-1	11	72	0.68	11.7 ±1.48	6.0 ±0.29	8.4 ±0.18	0.82 ±0.03	4.7 ±0.31	2.0 ±0.13
Over 1	8	124	1.8	16.7 ±1.3	6.3 ±0.21	8.5 ±0.32	0.76 ±0.10	4.3 ±0.19	1.6 ±0.10

9. (*a*) McLean, F. C., and Hastings, A. B.: The State of Calcium in the Fluids of the Body: I. The Conditions Affecting the Ionization of Calcium, J. Biol. Chem. **108**: 285-322 (Jan.) 1935. (*b*) Hastings, A. B., and others: The Ionization of Calcium, Magnesium, and Strontium Citrates, ibid. **107**: 351-370 (Oct.) 1934. (*c*) McLean, F. C., and Hastings, A. B.: A Biological Method for the Estimation of Calcium Ion Concentration, ibid. **107**: 337-350 (Oct.) 1934.

10. Sjöström, P.: Der Citratgehalt im Blutserum als Diagnosticum bei Krankheiten der Leber und der Gallenwege: Eine Methodologische, Tierexperimentelle und Klinische Studie, Acta chir. scandinav. **79**: 1-174 (supp. 49) 1937.

lief of portal hypertension. Eight of these patients received more than 2,000 cc. of blood and one patient more than 3,500 cc. As the rate of infusion was increased to 1 mg. per kilogram per minute (or approximately 500 cc. of blood in 15 minutes) for a patient who weighed 70 kg. (154 lb.) the concentration of serum citrate rose above 9 mg. per 100 cc. in half of the normal patients and in all but an occasional patient with liver disease. Correspondingly, there was an increasing tendency for the calculated ionized calcium level to fall, although in some infusion of large amounts of blood allowed us to calculate, roughly, the probable disposition of the infused citrate. (Infused citrate divided by plasma volume, estimated as 5% of body weight = elevation in serum citrate expected if all citrate remains in the vascular compartment.) Five patients receiving 0.75 to 1.7 gm. of citric acid within a period of six to nine minutes retained, by rough calculation, approximately half in the vascular compartment. Six patients who received 1 to 3 gm. of citrate ion in 11 to 16 minutes had apparently already redistributed it

TABLE 2.—*Patients with Depression of Calculated Ionized Calcium Below 0.8 mM. per Liter*

Case No.	Diagnosis or Operation	Total Transfused Blood, Cc.	Rate of Infusion of Citrate, Mg./Kg./Min.	Serum Citrate, Mg./100 Cc.	Total Protein, Gm./100 Cc.	Total Calcium, Mg./100 Cc.	Calculated [Ca^{++}], mM./Liter	Comment
1	Resection of thoracic aortic aneurysm and graft	5,500	0.9	54.7 *	5.6	8.0	0.35	Aorta clamped. No blood pressure measurable. Died 30 min. later
2	Pancreaticoduodenectomy and excision portal vein	3,500	0.6	44.0	...	11.6 ‡	(0.75)	No blood pressure measurable. Bleeding from all surfaces. Died at end of surgery
3	Ligation of bleeding esophageal varices (cirrhosis)	15,000	1.4	47.3	4.0	9.7	0.6	Systolic blood pressure 40 mm. Hg. Bleeding profusely from all surfaces. Died 5 hr. later. Fair response to intravenous injection of calcium
4	Massive intra-abdominal bleeding from needle biopsy of liver (cirrhosis)	3,500	2.3	26.4	5.6	7.2	0.55	Blood pressure 105/40 mm. Hg, but had just been in shock. Died 6 hr. after surgery
5	Resection of abdominal aortic aneurysm and graft	4,500	2.4	35.8	5.8	8.0	0.5	Blood pressure fell to 70/40 mm. Hg. Responded promptly to intravenous injection of calcium
6	Nephrectomy	4,500	6.0	41.9	5.8	8.8	0.55	Blood pressure 80/? mm. Hg in spite of apparently adequate blood replacement
7	Craniotomy under hypothermic anesthesia	2,500	0.32	16.3	6.1	7.7	0.65	Rectal temperature 25.8 C (78.4 F). Mean arterial pressure 80 mm. Hg
8	Resection of abdominal aortic aneurysm and graft	12,000	1.6	28.8	5.9	9.1	0.7	Blood pressure not measurable. Responded to rapid transfusion and intravenously administered calcium
9	Ligation of bleeding esophageal varices	4,500	1.0	15.3	8.3	7.4	0.65	Uneventful
10	Portacaval shunt for portal hypertension	2,500	1.3	20.0	7.2	8.5	0.65	Uneventful
11	Osteotomy with renal insufficiency	350	0.5	9.8	7.2	6.9	0.6	Blood pressure 90/50 mm. Hg
12	Post-shunt bleeding (cirrhosis)	3,500	0.4	15.0	6.1	7.0	0.65	Blood pressure 70/50 mm. Hg, just coming out of shock
13	Lobectomy (cirrhosis)	3,500	1.0	18.2	5.0	7.3	0.65	Uneventful
14	Emergency gastrectomy	6,500	0.9	11.8	4.3	6.6	0.7	Blood pressure 95/? mm. Hg. In shock earlier
15	Emergency gastrectomy, post adrenalectomy	2,500	0.9	6.2	6.8	6.9	0.7	Blood pressure 75/35 mm. Hg
16	Gastrointestinal bleeding (cirrhosis)	5,500	0.7	23.4	4.6	7.0	0.7	Blood pressure 55/30 mm. Hg. Recovered with further rapid transfusions and calcium intravenously
17	Bleeding esophageal varices	3,000	0.7	14.6	6.1	7.7	0.7	Blood pressure 98/70 mm. Hg
18	Splenorenal anastomosis (cirrhosis)	3,500	0.6	14.6	5.7	7.7	0.7	Uneventful
19	Bleeding esophageal varices	3,000	0.6	7.0 †	7.4	8.4	0.75	Uneventful
20	Splenorenal anastomosis (cirrhosis)	1,500	0.35	15.2	6.5	8.4	0.75	Uneventful
21	Portacaval shunt (cirrhosis)	3,000	0.5	9.5	7.7	8.5	0.75	Uneventful
22	Esophageal varices, hepatic coma	2,500	0.85	17.0	4.8	7.7	0.75	Blood pressure 125/70 mm. Hg. Died 6 days later
23	Bleeding abdominal aortic aneurysm, resection and graft	4,500	0.5	17.5	7.2	9.0	0.75	Blood pressure 150/100 mm. Hg. In shock earlier
24	Resection of abdominal aortic aneurysm and graft	5,000	1.1	13.0	6.5	8.3	0.75	Uneventful
25	Repair dehiscence (cirrhosis)	2,250	(1.3)	19.6 †	5.9	7.8	0.7	Uneventful
26	Splenorenal anastomosis	3,500	1.4	20.0	6.1	8.9	0.75	Uneventful
27	Splenorenal anastomosis	1,500	0.49	11.9	8.8	9.5	0.75	Uneventful
28	Splenorenal anastomosis	2,000	0.91	16.0	6.2	8.4	0.75	Uneventful

* Sample obtained from pleural cavity. † Venous sample. ‡ Received calcium intravenously before sample was drawn.

cases this was prevented or corrected by the intravenous administration of calcium, usually as the chloride salt.

At the lower rates of citrate infusion the concentration of serum citrate was roughly proportional to the infusion rate, although there was considerable variation from patient to patient. There was no correlation, at these low rates, between total infused citrate and the concentration of serum citrate. In contrast, when citrate was infused at rates above 1 mg. per kilogram per minute, the resultant serum citrate level correlated more closely with the total dose than with the rate at which it was given (table 3). In 11 patients, all of whom had normal liver function, arterial samples drawn just before and just after the rapid through the extracellular space. (Infused citrate divided by extracellular fluid volume [estimated as 20% of body weight] = elevation in the serum citrate level expected if citrate has been distributed evenly throughout the extracellular space but no metabolic breakdown has occurred.)

In many of the patients there were episodes of hypotension prior to and during the study periods. Brief episodes of moderate hypotension (i. e., blood pressure fall to 60 to 70 mm. Hg systolic for 20 to 30 minutes) were not associated with any increased citrate retention, and the mean serum citrate, at a given rate of citrate infusion, was the same for such patients as for normo-

tensive patients. Ten patients were studied in profound vascular collapse. Six of the 10 patients had no liver disease, and 5 of these 6 demonstrated no greater elevation

TABLE 3.—*Elevation of Serum Citrate Level After Brief Episode of Rapid Infusion of Citrated Blood*

Case No.	Time of Infusion, Min.	Amount Citrate Infused, Gm.	Rate of Infusion, Mg./Kg./Min.	Serum Citrate, Mg./100 Cc.		Increase in Citrate, Mg./100 Cc.	
				Initial	Final	Observed	Predicted *
5	9	1.2	2.4	18.2	35.8	17.6	11.0
6	11	3.0	6.0	15.2	41.9	26.7	33.0
8	9	1.2	1.6	8.8	28.8	20.0	7.0
29	6	1.0	2.4	(2.0)†	16.3	14.3	6.5
30	7	1.7	3.6	1.3	18.9	19.6	12.5
31	8	0.75	1.6	9.6 ‡	19.6 ‡	10.0	6.3
32	10	0.95	1.5	4.7	14.6	9.9	7.8
33	10	1.5	2.6	(2.0)†	8.5	6.5	13.0
34	11	1.0	1.4	1.3	8.9	7.6	7.7
34	16	1.5	1.5	3.2	15.7	12.5	11.5
35	12	1.0	1.3	(2.0)†	8.0	6.0	6.5

* Elevation in serum citrate that would have occurred if the infused citrate had been distributed evenly throughout the extracellular fluid space (assuming extracellular fluid space = 20% of body weight).
† No initial sample, but, since no preceding transfusion was given, the initial value is assumed to be the normal mean as shown in table 1.
‡ Venous sample.

calculated ionized calcium fell to 0.55 mM. per liter or below. Such a marked depression of ionized calcium must be considered critical. The isolated frog heart preparation of McLean and Hastings stops beating when the ionized calcium level is depressed to 0.5 mM. per liter,[9c] and Stefanini and others [11] have demonstrated a well-marked prolongation of coagulation time when ionized calcium is as low as 0.5 mM. per liter. An examination of the diagnoses and types of surgery listed in table 2 gives a clear picture of the situations in which difficulty with infused citrate has been encountered. Seventeen patients had moderate to severe liver disease; five had aortic resection and graft; one patient had an excision of the portal vein during pancreatectomy (thus interrupting a major portion of the blood supply to the liver). There were two emergency gastrectomies for massive hemorrhage, one radical nephrectomy for carcinoma, an osteotomy in a boy with advanced renal disease, and a craniotomy done with the patient under hypothermic anesthesia. It is of interest that this patient, who had a craniotomy and was the only one in this study under

TABLE 4.—*Changes in Serum Calcium After Intravenous Administration of Calcium Chloride*

Case No.	Diagnosis or Operation	Total Transfused Blood, Cc.	Serum Citrate, Mg. per 100 Cc.	Amount $CaCl_2$* Intravenously, Gm.	Elapsed Time Between Giving Calcium and Drawing Sample, Min.	Total Serum Calcium, Mg./100 Cc.		Increase in Serum Calcium, Mg./100 Cc.		Calculated Ionized Calcium, mM./L.		Blood Pressure, Mm. Hg	
						Before	After	Observed	Predicted†	Before	After	Before	After
2	Pancreatectomy and portal vein resection	2,000	35.0	2	120	9.1	11.6	2.5	4.1	...	0.75	Not measurable	70/?
3	Bleeding esophageal varices	8,300	47.8	2	10	9.7	11.4	1.7	5.8	0.6	0.7	40/?	55/?
		8,500	47.8	5	40	11.4	15.3	3.9	14.5	0.7	1.3	85/?	62/?
		10,000	36.3	3	105	15.3	16.2	0.9	8.7	...	0.9	60/30	60/30
5	Resection and graft aortic aneurysm	4,100	25.8	3	5	8.2	15.8	7.6	9.9	0.65	1.7	70/40	95/60
8		4,400	28.8	3	18	9.1	14.8	5.7	6.2	0.7	1.35	Not measurable	
13	Lobectomy (cirrhosis)	3,000	18.2	3	120	8.9	12.4	3.5	11.5	0.85	1.6	95/40	90/55
16	Gastrointestinal bleeding (cirrhosis)	7,000	23.4	1.5	30	7.9	8.9	1.0	3.1	0.7	0.85	90/60	85/60
23	Resection and graft bleeding aortic aneurysm	6,000	17.5	2	75	9.0	10.5	1.5	5.4	0.75	1.2	150/110	160/100
36	Craniotomy	2,250	11.7	1	6	8.1	11.3	3.2	(2.5)¶	0.85	1.35	90/60	100/50
37	.....	4,000	5.8	1	8	8.0	12.7	4.7	(3.0)¶	0.9	1.7	130/85	142/90
38	Nephrolithotomy	2,000	10.2	1	34	9.1	10.2	1.1	3.5	0.85	1.05	135/100	140/90
39	Intra-abdominal hemorrhage (cirrhosis)	2,000	17.7	1§	35	8.3‖	11.2‖	2.9	1.1	1.05	1.25	65/50	80/60
40	Splenorenal anastomosis‡	1,500	7.8	3	3	9.0	17.9	8.9	8.1	0.9	2.05	125/80	140/85
		1,500	....	..	7	...	15.9	6.9	...	...	...	.....	140/85
		1,750	9.2	..	26	...	13.6	4.6	...	...	1.4	.....	125/80
		1,850	10.3	..	39	...	12.1	3.1	...	...	1.1	.....	120/70
		2,000	8.4	..	70	...	11.8	2.8	...	...	1.1	.....	135/70
41	Abdominal perineal resection of rectum‡	500	4.7	2	7	8.4	20.4	12.0	5.8	0.9	2.55	156/70	108/50
		500	4.7	..	17	...	17.4	9.0	...	...	1.85	.....	178/84
		1,000	14.6	..	60	...	12.5	4.1	...	...	1.4	.....	98/72
		1,200	4.2	..	190	...	10.5	2.1	...	...	1.25	.....	.....

* 1 gm. of calcium chloride equivalent to 363 mg. of calcium ion.
† Increase that would have occurred if the infused calcium had been completely and evenly distributed throughout the extracellular fluid space (assuming extracellular fluid volume = 20% of body weight).
‡ Calcium given intravenously to this patient only to observe its distribution and disappearance and not as therapy.
§ 1 gm. of calcium levulinate given in this case, equivalent to 148 mg. of calcium ion.
‖ Venous sample. ¶ Based on estimated weight.

in citrate than the normotensive patients. On the other hand, three of the four patients with liver disease and in vascular collapse demonstrated spectacular elevations in citrate, shown in table 2 (cases 3, 4, and 16).

Table 2 presents data from 28 patients with serum citrate concentrations sufficiently elevated to depress the calculated ionized calcium level below 0.8 mM. per liter —clearly below the normal range. In five patients the hypothermia, had the highest serum citrate level observed for the rate at which he was receiving citrated blood (table 2, case 7). Rectal temperature was lowered to 25.8 C (78.4 F) in this patient to allow bilateral carotid and vertebral artery occlusion for periods of up to 15 minutes during the ligation of an intracranial aneurysm.

Intravenously Administered Calcium Chloride.—Calcium chloride was given intravenously whenever citric acid intoxication was suspected—usually because of persistent hypotension that did not respond to the replace-

11. Stefanini, M.: Studies on the Rôle of Calcium in the Coagulation of Blood, Acta med. scandinav. **136**: 250-266, 1950.

ment of blood loss with transfusions. Eleven patients receiving multiple transfusions were treated with intravenously administered calcium chloride (1 gm. of calcium chloride equivalent to 363 mg. of calcium) in doses from 1 to 10 gm. (table 4). Subsequent analyses showed that only 6 of these 11 patients needed calcium, that is, had a depression of the calculated ionized calcium level below the normal range. On the other hand, there were patients, such as in cases 4, 6, and 7, who needed calcium therapy but did not receive it. In four patients (cases 5, 8, 15, and 21) 1.5 to 3.0 gm. of calcium chloride elevated the calculated ionized calcium level to normal or above normal. The ionized calcium level of the patient in case 2 remained at 0.75 mM. per liter after administration of 2 gm. of calcium chloride, and a dose of 10 gm. of calcium chloride was not enough to correct the disturbance in the patient in case 3. While some patients did not receive enough calcium replacement, others received too much. The patient in case 5 (fig. 1), who received rapid transfusions during a difficult resection and graft of an abdominal aortic aneurysm, was given 6 gm. of calcium chloride in divided doses, responding each time with a temporary relief of hypotension. On subsequent analysis, it was found that the total serum calcium level had been elevated to 18.8 mg. per 100 cc. and ionized calcium to 2.25 mM. per liter, which are toxic or near toxic levels.[12]

Figure 2 shows one of the difficulties encountered in trying to determine the proper therapeutic dose of calcium chloride. The immediate elevation of the serum calcium level was roughly in proportion to the given dose of calcium divided by the estimated extracellular fluid volume (assumed to be 20% of body weight). But the error in estimated elevation of calcium was enormous—eightfold during the first 20 minutes, when accuracy of treatment is most important. Apparently there is a wide variation in the rate at which infused calcium diffuses from the vascular compartment into the extracellular fluid space and thence to further redistribution and utilization.

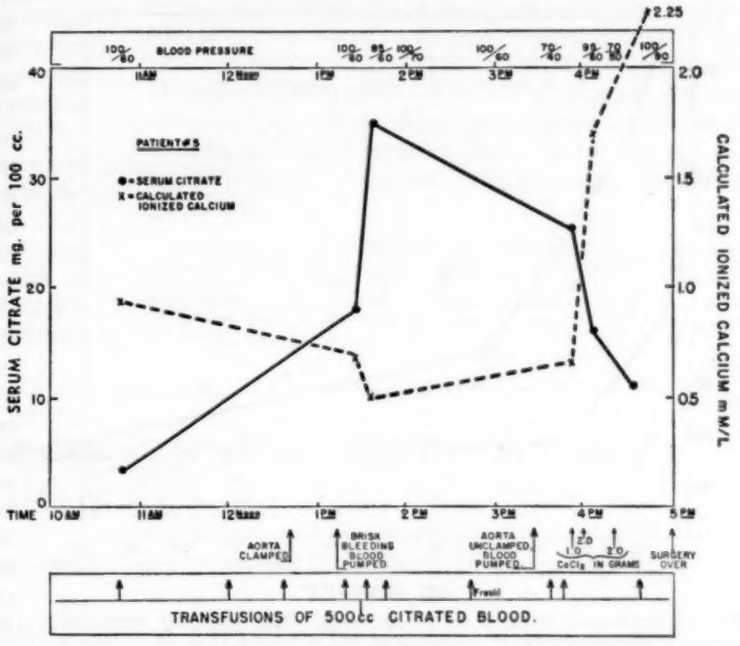


Fig. 1.—Changes in serum citrate and calculated ionized calcium levels during the resection and graft of an abdominal aortic aneurysm.

Changes in Serum Potassium.—It was of great interest to find that in no case was the serum potassium level seriously elevated. In view of the known large amount of potassium that may be released by the red blood cells into the plasma during the storage of banked blood,[13] it was feared that the cardiac depressant effect of a high serum potassium level might cause additional difficulties. The potassium level only occasionally rose as high as 5.5 mEq. per liter and in no case above 5.8 mEq. per liter (table 1).

COMMENT

In most of the cases we have studied it has not been possible to implicate the elevated citric acid level as solely or even partially responsible for hypotension or difficulties in blood coagulation. Usually the clinical situation is a complex one. The very fact that transfused blood is required in large amounts suggests that blood loss has been heavy, and so, of course, it is difficult to differentiate the hypotension of diminished blood volume from hypotension secondary to a low serum ionized calcium level. However, the patients in cases 3 and 5 (table 4) demonstrated hypotension that responded promptly and repeatedly to intravenously administered calcium, and the patient in case 6 (table 2) had a persistent hypotension in spite of apparently adequate blood replacement. (The extraordinary rise in the serum citrate level had not been anticipated in this case, and calcium was not given.) The patients in cases 1 to 4 (table 2), represent what is probably the most serious danger from infused citrate. All four patients were in profound vascular collapse, and all died during or shortly after the completion of surgery. The rapid blood transfusions given in an attempt to resuscitate these patients depressed ionized calcium to levels from which even a normal heart could hardly be expected to recover. Recent studies by Watkins[14] have demonstrated that a dog subjected to graduated blood loss exhibits a marked decrease in circulatory tolerance (as reflected in blood pressure and electrocardiogram) to infused citrate; it may reasonably be assumed that the human heart is at a similar disadvantage when faced with the double insult of low circulating blood volume and a low serum ionized calcium level.

The role of a depressed calcium level in operative bleeding has been equally difficult to evaluate. Mayer[15] did not observe any prolongation of clotting or bleeding times in 15 patients who received from 3,000 to 5,000 cc. of citrated blood during pulmonary surgery. But a

12. Hoff, H. E.; Smith, P. K., and Winkler, A. W.: Electrocardiographic Changes and Concentration of Calcium in Serum Following Intravenous Injection of Calcium Chloride, Am. J. Physiol. **125**: 162-171 (Jan.) 1939.

13. Rapoport, S.: Dimensional, Osmotic, and Chemical Changes of Erythrocytes in Stored Blood: I. Blood Preserved in Sodium Citrate, Neutral, and Acid Citrate-Glucose (ACD) Mixtures, J. Clin. Invest. **26**: 591-615 (July) 1947.

14. Watkins, E., Jr.: Experimental Citrate Intoxication During Massive Blood Transfusion, Surgical Forum, October, 1953, Proceedings of the Clinical Congress of the American College of Surgeons, Philadelphia, W. B. Saunders Company, 1954, pp. 213-219.

15. Mayer, A.: The Relationship of Bleeding and Clotting Times to Massive Transfusions of Citrated Blood, Surgery **33**: 79-82 (Jan.) 1953.

depression of ionized calcium to levels observed in some of our patients has been demonstrated by Stefanini to prolong the coagulation time in vitro.[11] During the present study, coagulation time (Lee-White method) was measured in 14 patients and was prolonged above 10 minutes in 3 patients; however, there was no correlation between elevation in coagulation time and depression in the calculated ionized calcium level. The uncontrollable bleeding that we occasionally observed is more likely to be related to other factors. The titer of prothrombin accelerator factors is diminished in routinely collected banked blood, and platelets are almost nonexistent. Considerable evidence has already been collected by Stefanini suggestive of the importance of these factors in hemorrhage associated with multiple transfusions.[16] Further studies of the relationship of multiple transfusions to disturbances in coagulation are currently being carried out by us in the laboratory. Somewhat against the diagnosis of citric acid intoxication in the cases we have studied is the fact that tetany was not observed. On the other hand, the patients with the greatest depression of ionized calcium level were in profound vascular collapse or under general anesthesia, either of which might well mask the manifestations of increased nervous and muscular irritability.

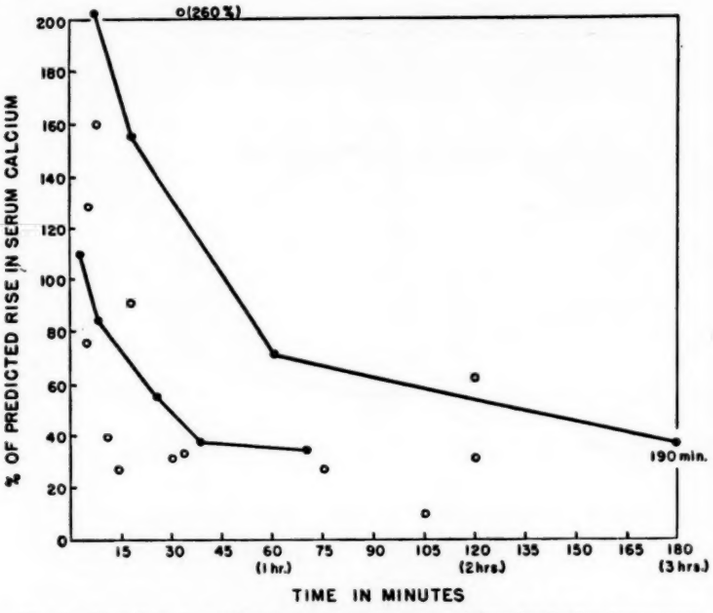


Fig. 2.—Variations in predicted rise in total serum calcium level after intravenous injections of calcium chloride. Calculated from data in table 4. Ordinate = ratio of observed elevation in serum calcium to calculated elevation in serum calcium that would have occurred if infused calcium had been distributed evenly throughout extracellular space (assuming extracellular fluid volume = 20% of body weight). Abscissa = elapsed time since intravenous administration of calcium. The solid lines are calculated from serial calcium determinations in two patients who received single doses of calcium chloride of 2 gm. (upper line) and 3 gm. (lower line).

An examination of the published and unpublished experiences of others supports the view that citric acid intoxication can and does occur, frequently with a fatal outcome. During exchange transfusions in infants Wexler and co-workers[2] observed elevations in serum citrate level up to 120 mg. per 100 cc., more than twice as high as any in our series, and they routinely encountered symptoms of tetany requiring repeated intravenous administration of calcium gluconate. Of the eight cases reported by them, the single death reported was possibly related to the infused citrate. Ames, Syllm, and Rapoport[3] reported serum citrate values from 18 to 53 mg. per 100 cc. in nine infants receiving rapid infusions of citrated plasma. In one of these patients severe tetany developed, and another (with the highest serum citrate level) died during the infusion. The calculated rates of infusion of citrate ion in Wexler's and in Ames' cases were high, 5 to 10 mg. per kilogram per minute, but of the same order of magnitude as in some of the cases in the present study. Mellone and Yahn[17] have presented the case of an infant weighing 11 kg. (24 lb.) who received 3.6 gm. of citrate intravenously in a period of 15 minutes—a rate of 22 mg. per kilogram per minute. The infant died in "generalized tetany," with "impressive opisthotonus, dyspnea, rigidity, and with pupils dilated."

In this hospital, but not during this study, a 9-year-old boy with traumatic rupture of the liver received 7,000 cc. of citrated blood and 500 cc. of citrated plasma in 11 hours (at an estimated rate of infused citrate of 1.1 mg. per kilogram per minute) and died having been in and out of tetany several times. In a nearby hospital a second patient, a 63-year-old woman with bleeding esophageal varices, received 8,500 cc. of citrated whole blood over a period of seven hours, with subsequent tetany and death. The diagnosis of citric acid intoxication was not missed in these two cases. The boy was given 14 gm. of calcium gluconate intravenously (equivalent to 1.25 gm. of calcium), and the woman received 23 gm. of calcium gluconate (equivalent to 2.1 gm. of calcium). On the basis of the present study it is difficult to estimate how high the citrate level rose in these cases or whether the calcium therapy was too little or too much.

At the time of the original studies of Ivy and coworkers,[18] and of Bruneau and Graham,[19] it was inconceivable that the vast quantities of citrated blood necessary to produce fatal citric acid intoxication in a dog would ever be used in man, but it is now clear that the clinical counterpart can and does occur. Furthermore, it is possible to predict with assurance that citric acid intoxication is likely to occur during multiple transfusions of citrated blood in patients with liver disease or with mechanical obstruction to hepatic circulation and in any patient, with or without liver disease, during extremely rapid and prolonged infusions of citrated blood or plasma. With the recent rapid development of cardiac and great vessel surgery there has been an equally rapid increase in the danger of citrate intoxication associated with mechanical obstruction to hepatic circulation. Such

16. Stefanini, M.; Mednicoff, I. B.; Salomon, L., and Campbell, E. W.: Thrombocytopenia of Replacement Transfusion: A Cause of Surgical Bleeding, Clin. Research Proc. **2**: 61 (April) 1954.

17. Mellone, O., and Yahn, O.: Tetania postransfusional pelo citrato de sódio, Arq. cir. clin. e exper. **12**: 369-374 (July-Aug.) 1949.

18. Ivy, A. C., and others: Effect of Various Blood Substitutes in Resuscitation After an Otherwise Fatal Hemorrhage, Surg., Gynec. & Obst. **76**: 85-90 (Jan.) 1943.

19. Bruneau, J., and Graham, E. A.: A Caution Against Too Liberal Use of Citrated Blood in Transfusions, Arch. Surg. **47**: 319-325 (Oct.) 1943.

obstruction may be caused by surgical occlusion of the portal vein or the thoracic aorta, as demonstrated above, or during open cardiac surgery under hypothermia (with temporary interruption of the entire circulation), as recently pointed out by Cookson and co-workers.[20] Induced hypothermia probably compounds the danger, since the rate of citrate utilization may be expected to be severely depressed, along with other metabolic processes, by lowered temperature. This is supported by the one reported patient studied during hypothermia.

The treatment of citric acid intoxication with intravenously administered calcium salts has not been satisfactory in our hands. It has been difficult to predict accurately how high the citrate level has risen or how great a rise in serum calcium level will occur after a given intravenous dose of calcium chloride. There is, consequently, a real danger of calcium overdosage. Possibly a better solution is to avoid citrated blood altogether in cases where citrate intoxication might be feared. Other chelating agents have recently been made available for the preservation of blood, such as ethylene diamine-tetraacetic acid disodium, but, until more is known about the destruction and elimination of these agents by the body, they must be considered to be potentially dangerous as binders of calcium. Decalcified blood, collected by passage across a cation exchange resin, is a nearly ideal preparation for multiple rapid transfusions. In passage across the exchange resin serum calcium (as well as potassium and magnesium) is replaced with sodium ion and clotting thus prevented. During multiple transfusions of blood collected in this manner the calcium ion lacking in the transfusions can be accurately replaced. Packed red blood cells, or resuspended red blood cells, as recommended by Gibson,[21] can also be used to advantage when citric acid intoxication is feared.

SUMMARY

Serum citrate, calcium, total protein, magnesium, and potassium levels were measured in 130 patients during the transfusion of moderate to large volumes of citrated blood. In many cases there were marked elevations in serum citrate level sufficient to depress the ionized calcium level seriously. Very high concentrations of serum citrate were observed during multiple transfusions in patients with liver disease or mechanical obstruction to hepatic circulation and in all patients, with or without liver disease, during extremely rapid or prolonged infusions of citrated blood or plasma. Intravenously administered calcium salts were not found to be very satisfactory in the treatment of patients with clinical citric acid intoxication. It is suggested that citrated blood be avoided altogether in cases where citric acid intoxication is feared. Other available preparations appear to be more suitable, such as decalcified blood collected by passage across a cation exchange resin and packed or resuspended red blood cells.

20. Cookson, B. A.; Costas-Durieux, J., and Bailey, C. P.: The Toxic Effects of Citrated Blood and the Search for a Suitable Substitute for Use in Cardiac Surgery, Ann. Surg. **139**: 430-438 (April) 1954.

21. Gibson, J. G., II.: Use of Separated Human Red Cells: A Report of Current Practice and Progress, New England J. Med. **255**: 976-980 (June 10) 1954.

TRANSVENTRICULAR COMMISSUROTOMY IN AORTIC STENOSIS

A CLINICAL EVALUATION

William Likoff, M.D., Donald Berkowitz, M.D., Clarence Denton, M.D., Harry Goldberg, M.D.
and
Attilio Reale, M.D., Philadelphia

Stenosis is the commonest lesion of the aortic valve and generally results from the organization of the endocardial exudate accompanying rheumatic activity. Less frequently it may be due to a congenital malformation, in which the valve is usually bicuspid, or to a degenerative calcific sclerosis. In the rheumatic type, the valvular orifice is either symmetrically or eccentrically reduced by the fusion of the commissures. The basic structural change may be complicated at any point in its development by calcific infiltration. A surgical method to correct the commissural fusion of rheumatic aortic stenosis was conceived and employed by Bailey and his associates in 1950.[1] This study analyzes the clinical experiences in a group of patients who have been treated with this procedure since that time. It is restricted to the 79 patients who had an aortic commissurotomy alone. Another 78 who had aortic and mitral commissurotomies simultaneously will be reviewed in a subsequent study.

MATERIAL OF STUDY

The 79 patients consisted of 65 males and 14 females, ranging in age from 14 to 67 years. They were divided into three groups (table 1). Group 1 consisted of 33 patients in whom aortic stenosis was the only valvular lesion. Group 2 included 36 patients in whom aortic stenosis was combined with other valvular lesions which were physiologically insignificant. In 32 of these patients, aortic insufficiency was the only other involvement. Group 3 consisted of 10 patients in whom aortic stenosis was associated with valvular lesions other than mitral stenosis, at least one of which was physiologically significant and was not corrected at the time of surgery. In seven of these patients, aortic insufficiency was the only other involvement. Except for a total of seven patients, therefore, the major difference in the patient ma-

From the Department of Medicine, Hahnemann Medical College and Hospital (Associate Professor of Medicine, Dr. Likoff; Formerly, Chief Resident in Medicine, Dr. Berkowitz; Instructor in Medicine, Dr. Denton; Assistant Professor of Medicine, Dr. Goldberg; and Cardiac Fellow, Dr. Reale) and the Bailey Thoracic Clinic (Drs. Likoff, Denton, and Goldberg).

This study was supported in part by funds from the American Heart Association.

1. Bailey, C. P.; Glover, R. P.; O'Neill, T. J. E., and Redondo Ramirez, H. P.: Experience with the Experimental Surgical Relief of Aortic Stenosis: A Preliminary Report, J. Thoracic Surg. **20**: 516-541 (Oct.) 1950.

terial was the additional presence of aortic insufficiency of an insignificant or significant degree. Specific criteria were established to distinguish significant from insignificant valvular involvement in those patients with combined lesions.

Aortic Regurgitation.—Inasmuch as the amount of regurgitation cannot be estimated directly at the time of surgery, one of the following criteria, even in the absence of the remaining two, was accepted as an indication of significant regurgitation: (1) the presence of a long, blowing, early diastolic murmur at the second right or third left interspace, accompanied by a diastolic blood pressure of 50 mm. Hg or less and a pulse pressure of at least 60 mm. Hg; (2) an abnormal brachial artery tracing characterized by low or absent dicrotic notch; and (3) the demonstration, on surgical exploration, of a diastolic thrill over the root of the aorta or, in the absence of mitral stenosis, over the apex of the left ventricle or at the septal leaflet of the mitral valve.

TABLE 1.—*Diagnoses and Mortality Rates in Seventy-Nine Patients Who Had Aortic Commissurotomy*

Group	Valvular Lesions: Significant	Valvular Lesions: Insignificant	No. of Patients	Deaths	Mortality, %
1	Aortic stenosis	.....	33	6	18.1
2	Aortic stenosis	Aortic insufficiency	32	6	18.7
	Aortic stenosis	Mitral insufficiency, mitral stenosis	1	0	....
	Aortic stenosis	Aortic insufficiency, mitral insufficiency, mitral stenosis	3	0	....
3	Aortic stenosis, aortic insufficiency	.....	7	5	71.4
	Aortic stenosis, aortic insufficiency	Mitral insufficiency	1	0	....
	Aortic stenosis, mitral insufficiency	.....	1	0	....
	Aortic stenosis, mitral insufficiency	Aortic insufficiency	1	0	....
		Total	79	17	21.5

Mitral Regurgitation.—The degree of mitral regurgitation can be determined directly at the time of surgery. This lesion was considered significant when the surgeon, on exploration of the valve, estimated the regurgitant jet to be 10 cc. or greater with each systole. Where the valve was not examined, significant regurgitation was diagnosed if cardiac catheterization revealed a V-wave curve in the pulmonary capillary system.

Mitral Stenosis.—The degree of mitral stenosis can be estimated directly and was considered significant when the valve orifice would not permit the free passage of two fingers. When the valve was not explored, the presence of a diastolic thrill over the apex of the left ventricle, in the absence of aortic regurgitation, was accepted as an indication of mitral stenosis.

RESULTS

Preoperative Findings.—The preoperative symptomatic pattern, roentgenologic and electrocardiographic examinations, brachial artery tracings, and ballistocardiograms were analyzed to determine a basis for comparison with postoperative observations. Aortic stenosis alone or in combination with valvular lesions other than significant mitral stenosis occurred predominantly in the male; the vast majority of patients failed to recall the initial attack of rheumatic fever or any of its lesser manifestations (table 2).

Fatigue was the earliest and most frequent symptom in pure and combined stenosis. Dyspnea was common as a slowly progressive complaint for years in the majority of patients before it resulted in serious incapacitation. In contrast, paroxysmal dyspnea with pulmonary edema was less frequent, occurring in 20% of the patients. Without exception, the paroxysmal form developed only after exertional dyspnea had been noted previously. Angina was the third commonest symptom. It was never observed in the absence of easy fatigability or limitation due to exertional dyspnea. It, too, was present for years but led to incapacitation earlier. The likelihood of angina increased in the presence of significant aortic regurgitation, occurring in six of eight such patients. Vertigo was reported by 48% and syncope by 42% of the patients in group 1. These symptoms, in contrast to angina, were less common when aortic regurgitation was present, particularly when that lesion was significant. Peripheral edema, observed in 30% of the patients with pure aortic stenosis, occurred more commonly with the additional presence of aortic regurgitation. Hemoptysis was experienced by 20% of the patients. This was not materially influenced by the presence of aortic regurgitation but occurred with greater frequency in those patients with additional mitral disease. Atrial fibrillation was not present in the paroxysmal or chronic form in any patient

TABLE 2.—*Preoperative Data on Seventy-Nine Patients with Aortic Stenosis*

	Group 1		Group 2		Group 3		Total	
	No.	%	No.	%	No.	%	No.	%
Total no. of patients	33	100	36	100	10	100	79	100
Male	31	94	26	70	8	80	65	82
Female	2	6	10	30	2	20	14	18
History of rheumatic fever	9	27	4	12	5	50	18	22
Manifestations								
Fatigue	32	97	35	97	10	100	77	98
Dyspnea								
Under 1 yr	9	27	2	6	1	10	12	15
2-5 yr	21	54	21	63	7	70	49	63
Over 5 yr	3	9	13	28	2	20	18	22
Pulmonary edema	9	27	6	18	2	20	17	20
Angina	20	60	19	53	7	70	46	58
Syncope	12	42	9	25	1	10	22	27
Vertigo	16	48	11	33	2	20	29	36
Edema	10	30	17	47	4	40	31	39
Ascites	0	0	0	0	0	0	0	0
Hemoptysis	5	15	9	25	2	20	16	20
Emboli	0	0	3	9	0	0	3	4
Blood pressure								
Normal	24	73	31	85	9	90	64	81
Above 150 mm. Hg systolic	3	9	3	9	1	10	7	9
Below 100 mm. Hg systolic	6	18	2	5	0	0	8	10
Rhythm on admission								
Normal sinus	33	100	32	88	9	90	74	94
Atrial fibrillation	0	0	4	12	1	10	5	6
Aortic second sound								
Normal	2	6	3	9	0	0	5	6
Decreased	31	94	33	91	10	100	74	94
Thrill	31	94	33	91	5	50	69	87
Heart size								
Normal	1	3	3	9	1	10	5	6
1+	8	25	9	25	1	10	18	22
2+	14	42	18	54	4	40	36	44
3+	5	15	3	9	4	40	12	15
4+	5	15	3	9	0	0	8	13

with pure aortic stenosis. It was observed in five of the seven patients with additional insignificant mitral lesions. Emboli occurred in three patients, each of whom had atrial fibrillation.

The blood pressure levels were normal in 81% of the patients. The systolic pressure was more likely to be below 100 mm. Hg in pure stenosis than in the combined lesions. There was no exception to the finding of a loud, rough systolic murmur at the base of the heart. In all but five patients, this was accompanied by an absent or decreased second aortic sound. A systolic thrill was palpated in 94% of patients with pure stenosis. The size of

TABLE 3.—*Causes and Times of Deaths Following Aortic Commissurotomy*

Cause of Death	Group 1	Group 2	Group 3	Total	Time After Operation
Ventricular fibrillation..	4	2	3	9	Immediate
Hemorrhage.....	1	3	1	5	Immediate
Cerebral embolism.....	1	..	..	1	55 days
Renal failure.....	..	1	..	1	7 days
Aortic insufficiency, created	..	..	1	1	1 day

the heart on rentgenograms was increased 2+ or greater in 70% of patients, and the contour was typical of aortic stenosis in all these patients. Varying degrees of calcification were observed in 50% on fluoroscopic or x-ray examination.

All but four patients had abnormal electrocardiograms. The commonest pattern was that of left ventricular hypertrophy and "strain," which appeared in 68% of the patients. Intraventricular conduction defects were uncommon, appearing in three patients. Auriculoventricular conduction defect was noted in the same number of patients. In spite of the common occurrence of angina, a pattern specific for coronary artery disease was diagnosed in only three instances, and there was not a single electrocardiographic example of a myocardial infarction, old or new. In all of the patients subjected to brachial artery tracings, an anacrotic notch or a slurring of the ascending limb of the curve with a delay in its peak was observed.[2] The ballistocardiogram was abnormal in 46 (85%) of the 54 patients examined. The most consistent abnormality was a shallow K wave, which was observed in 40 patients under basal conditions. Abnormalities of amplitude, regularity in pattern, response to deep inspiration, and exercise occurred with such inconsistency that they could not be relied on for future comparison. The ballistocardiogram was considered abnormal only when alterations in the K wave were present or when the contour was sufficiently bizarre on other accounts to be classified as a group 4.[3] In the seven patients with additional significant regurgitation but no other complicating lesion, the K wave was consistently deeper than in pure stenosis.

Operative Mortality.—The operative mortality in group 1 was 18.1%, and in group 2, 18.7%. In group 3, 50% of the patients died. The mortality for all patients was 21.5% (table 1). The immediate causes of death and the time relation of operation to death are listed in table 3. The mortality was further correlated with age, heart size, the presence of angina, the finding of congestive failure on admission to hospital, and the functional classification of the patients.

Postoperative Hospital Course.—Cardiac complications without mortality occurred in 12 (19.3%) of the patients (table 4). Atrial fibrillation developed in six patients during the first postoperative week. The type of valvular involvement had no bearing on this event, since four patients had pure stenosis and two had additional but insignificant mitral disease. The rhythm was reverted to a normal sinus mechanism in half of these patients, with equal facility independent of the type of lesion. Congestive heart failure occurred in four patients, one of whom had additional but insignificant aortic regurgitation. Recovery was complete in all of these patients. Pericarditis with effusion developed in two patients, in one of whom a single pericardial tap was required. Pulmonary complications, without death, were encountered in 24 (38.7%) of the patients surviving operation. However, in 20 of these patients the complication of a simple left pleural effusion that was promptly relieved by thoracentesis. Retained secretions severe enough to require bronchoscopy occurred in two patients, and there was but a single instance each of atelectasis and of hemopneumothorax. Febrile reactions which persisted longer than the fifth postoperative day were considered a complication. These were encountered in nine patients. The cause in one patient was later established as micrococcic (staphylococcic) subacute bacterial endocarditis, from which the patient died in three months. This was the only instance of subacute bacterial endocarditis in the entire series. The temperature elevations of the remaining nine patients subsided by the 12th postoperative day. Miscellaneous complications included severe anemia requiring transfusion, epistaxis, and impaired renal function with elevation of the blood urea nitrogen level.

TABLE 4.—*Postoperative Complications in Hospital Following Aortic Commissurotomy*

Complications	Group 1	Group 2	Group 3	Total
Cardiac				
Atrial fibrillation (converted).....	1	1	1	3
Atrial fibrillation (not converted)	2	1	0	3
Congestive failure	3	1	0	4
Pericarditis	0	2	0	2
Pulmonary				
Left effusion	12	7	1	20
Retained secretions	2	0	0	2
Hemopneumothorax	0	1	0	1
Atelectasis	1	0	0	1
Miscellaneous				
Anemia	3	2	0	5
Renal failure	1	2	0	3
Epistaxis	0	1	0	1
Fever (unexplained)	7	2	0	9

Follow-Up.—The follow-up evaluation was limited to those patients who had been operated on at least three months previously. Two deaths in this group occurred, one in three months due to subacute bacterial endocarditis and the other in seven months as the result of congestive heart failure which had been present prior to operation and recurred following discharge from the hospital. Of the remaining 60 patients, 44 had had opera-

2. Goldberg, H.; Bakst, A., and Bailey, C. P.: The Dynamics of Aortic Vascular Disease, Am. Heart J. **47**: 527, 1954.

3. Brown, H. R., Jr.; de Lalla, V., Jr.; Epstein, M. A., and Hoffman, M. J.: Clinical Ballistocardiography, New York, the Macmillan Company, 1952.

tion at least three months previously. Table 5 indicates the group classifications and the time in months between operation and the follow-up review.

Of 42 patients (table 6) who had experienced fatigue as a major preoperative symptom, 36 (85.7%) were significantly improved. Of the three patients whose fatigue was severer after operation, one had marked hypertension, for which a previous sympathectomy had been performed, and one had a significant mitral insufficiency. The third patient was markedly improved for 12 months following operation and then gradually developed increasing disability, the explanation for which was not clear. Of the 37 patients who had dyspnea, 33 (89.1%) were improved after operation. Seven of these patients no longer experienced the complaint. The one instance of increased dyspnea was in the patient previously cited with hypertension. Nineteen patients complained of significant angina preoperatively. Of these, 18 (94.7%) were markedly improved, and 6 no longer had the complaint. All of the patients with vertigo were improved, and in three the symptoms disappeared entirely. Of the 13 patients who had had syncope, not one had experienced a similar attack postoperatively. Thirteen patients had had peripheral edema, and of these, nine no longer noticed this finding and one observed considerable improvement.

TABLE 5.—*Follow-Up Review of Forty-Four Patients After Aortic Commissurotomy*

	Group 1	Group 2	Group 3	Total
No. of patients	19	21	4	44
Deaths since operation	1	1	0	2
Duration of follow-up in survivors, mo.				
3-6	3	2	..	5
6-12	7	14	4	25
12-18	6	3	..	9
18-24	2	1	..	3
Total survivors followed	18	20	4	42

The most significant change noted in blood pressure levels was an increase in pulse pressure, which occurred in 10 patients. In seven, the diastolic levels were lowered, and in three the increased pulse pressure resulted from higher systolic levels. In two patients, the pulse pressure was decreased because of a lower systolic value. A rough aortic systolic murmur had been heard in all patients preoperatively. In nine, the rough murmur became blowing in character and reduced in intensity. In 19 of the remaining 33 patients (57.3%) the murmur remained rough but less intense. Otherwise stated, successful aortic commissurotomy resulted in a change in either the quality or the intensity, or both, of the systolic murmur in 6 of every 10 cases at least three months after operation. Thirty-seven patients had a decreased aortic second sound prior to operation. Following operation, the aortic second sound was increased in intensity in 28 (75.6%). In six of these, the sound was considered normal. In six patients, an early blowing diastolic murmur was heard after operation where no murmur was present preoperatively. In two additional patients, the intensity of the previously existing murmur was increased. A significant aortic regurgitation in three of these eight patients was indicated by an appreciable increase in pulse pressure. One of these may have had congenital aortic stenosis. Two patients with preoperative aortic diastolic murmurs did not have this auscultatory finding following operation. Since these auscultatory findings were discovered immediately after operation, it appears that the risk of creating a significant aortic insufficiency following commissurotomy for rheumatic stenosis, where none had previously existed, is 5% and that of creating or increasing an early diastolic murmur is 13%. There was no significant alteration in the contour of the heart in any of the patients following aortic commissurotomy. In those instances where the transverse measurement of the heart decreased, the contour remained typical of aortic stenosis. Although the transverse measurement in four patients decreased 1 cm. or more, significant changes in size were the exception.

Of the 38 patients with abnormal electrocardiograms, 6 (15.7%) were returned to normal limits. All of these previously had patterns indicating left ventricular hypertrophy and strain. In no case were the changes secondary to the withdrawal of digitalis. In five patients (13.1%) the ventricular conduction time was increased. The electrical position of the heart was altered from horizontal to vertical in 15 patients (39.4%). Although a transventricular wound resulted from commissurotomy, no pattern was obtained indicating acute myocardial infarction. An increase in the depth of the K wave in the ballistocardiogram was observed in 32 of the 40 patients (80%) who had had shallow waves preoperatively. Included in this group, however, are the eight patients in whom an aortic diastolic murmur was created or its intensity increased. The amplitude of the systolic complexes was increased following operation, but the inconsistency in this regard preoperatively obviated definite conclusions.

In the late convalescent period, from the time of hospital discharge through the duration of this follow-up study, four patients had embolic accidents. Three involved the retinal artery and one, the cerebral circulation. Eight patients (19%) had episodic febrile reactions requiring further periods of bed rest or antibiotics, or both.

TABLE 6.—*Symptomatic Comparison in Patients Followed After Aortic Commissurotomy*

Symptom	No. of Patients with Symptom Preoperatively	Postoperative Result				
		Not Present	Markedly Improved	Improved	Same	Worse
Fatigue	42	..	22	14	3	3
Dyspnea	37	7	26	6	3	1
Angina	19	6	9	3	1	..
Edema	13	9	1	..	3	..

COMMENT

The proper analysis of the surgical management of aortic stenosis rests with an understanding of the subjective and objective expressions of the disease, the influence of medical therapy on that pattern, and the comparative effectiveness, limitations, and risks of operation. A short period of time has elapsed since the successful application of aortic commissurotomy and this clinical analysis. Under the circumstances, many of the details which form the firm substance of a final appraisal must

await future observation. It is a confession of impatience and impracticality to expect rebirth of the chronic cardiac patient through the medium of surgical skills. However, searching inquiry into the basic trends which result from surgery will lead to mature evaluation of its effectiveness. In this search unfounded acclamation and prejudiced condemnation are born of an undisciplined, unrealistic reaction to facts. The proof of worth rests equally with time-honored clinical comparisons and with objective studies. One is never a satisfactory replacement for the other, and each must be judged on its own merit. Is aortic commissurotomy ineffective because it does not alter heart size when it can decrease angina? Is it more effective just because it returns a brachial artery to a more normal pattern? A vast, untouched area of correlations gives rise to such paradoxes. Symptomatic and objective patterns develop at their own pace in aortic stenosis, as they do in other types of valvular involvement. Until the relation of one to the other is clear, the response of one and not the other is possible even if not understandable.

Criteria for Material of Study.—In the analysis of clinical results as many imponderables were eliminated as was feasible. For that reason, this initial study was limited to patients who had aortic stenosis alone or in whom, when other involvement was present, this lesion was significant, and in whom commissurotomy was the only surgical procedure attempted.

Of the three methods of defining significant aortic regurgitation, two, the wide pulse pressure and the abnormal brachial artery curve, are entirely acceptable. A diastolic thrill over the root of the aorta, the left apex, or the septal leaflet of the mitral valve, however, is probably more related to the intensity and duration of the murmur than to the magnitude of the lesion. In some instances this finding was not accompanied by a wide pulse pressure or abnormal brachial artery tracing. The reverse, however, was never observed. The decision to accept the thrill as an indication of significant involvement may have resulted in some errors of classification. The V-wave curve in the pulmonary capillary system during catheterization is acceptable evidence of a significant lesion due to mitral regurgitation. The direct method of estimating the quantity of regurgitation, however, depends on variable factors such as the force of ventricular contraction when the patient is under anesthesia and the heart is undergoing manipulation, the integrity of the circulation at the time of examination, and the accuracy of the surgeon's exploring finger. In addition, there is no conclusive evidence that 15 cc. and not 10 cc. of regurgitation results in lesions. In spite of these objections, this remains the only direct means of examination and, as such, is useful.

Symptoms of Aortic Stenosis.—It is abundantly clear in this study that a symptomatic pattern exists for aortic stenosis alone and combined with insignificant and significant regurgitation. This pattern is at variance with the concept that aortic involvement is generally asymptomatic until late in the disease and, thereafter, becomes rapidly progressive. A total of 85% of the patients had dyspnea for two years or more, and 22%, for longer than five years. It was not unusual for excessive fatigability to have been present for a decade. The slowly progressive manifestations of the disease were generally altered by the occurrence of new symptoms such as acute paroxysmal dyspnea, angina, vertigo, syncope, or peripheral edema, after which a more rapid deterioration resulted. Even then progress could continue at a slow pace. In many instances, angina existed for three years and recurrent peripheral edema for an equal time. The chronicity of the symptoms was an ally in postoperative comparisons. Patients had become thoroughly acquainted with their disability and its episodic nature. They had, as a group, surprising insight into the factors which precipitated symptoms and the measures necessary to avoid difficulty. A common experience was the patients' self-imposed restriction adopted to preserve functional integrity even without a physician's instruction. The contention, therefore, that a patient with chronic, unpredictable disease is in the poorest position to judge benefit is more shadow than substance.

Medical and Surgical Relief of Symptoms.—No patient was subjected to operation who had not had previous medical treatment. The average therapy extended over 4.6 years. Digitalis or an allied product has been prescribed for an average of 3.8 years. This prolonged experience with medical management again resulted in a basic knowledge of the pattern of the disease for both patient and physician and was a firm backdrop for postoperative comparisons. Repeated examples of improvement under medical routines were observed. However, improvement in fatigability, dyspnea, or angina was never observed for a prolonged period of time, regardless of therapy, unless physical restriction of some degree was proposed by the physician or automatically imposed by the patient. It was repeatedly demonstrated that once symptoms developed in aortic stenosis they never abated completely under an unrestricted routine. Only the speed of deterioration was unpredictable. Compared to the definite symptomatic pattern and its chronicity under adequate previous medical management, the postoperative improvements in fatigability, dyspnea, and angina were impressive, particularly since they were observed under a more rigorous routine of work than had been possible formerly.

Postoperative Changes in Cardiac Findings.—The postoperative changes were not restricted to the subjective pattern. Past experiences with auscultation following cardiac surgery show that there is no direct relation between these findings and the degree of benefit. It would be strange indeed if traumatic surgical measures could reconstitute a valve so that murmurs did not persist. The change in the quality or intensity of the systolic murmur in approximately half of the patients following aortic commissurotomy cannot be accepted as a major accomplishment until these characteristics are more objectively recorded and their relation to the size of the valve orifice, blood flow, and endocardial integrity is better understood. It is probable that altered valve function resulting from operation is better reflected in heart sounds. Such a correlation has crystallized after mitral commissurotomy. If that contention is substantiated with time, the altered aortic second sound in three-fourths of the patients following aortic commissurotomy is an important objective

gain. The creation or exaggeration of the murmur of regurgitation is a serious development. The exchange of a significant stenosis for a significant regurgitation at the cost of a serious operation is an important and regrettable result, the infrequency of which is small solace.

The change in the electrical position of the heart in over one-third of the patients following aortic commissurotomy cannot be adequately explained. Marked rotation is not seen commonly following mitral commissurotomy. Significant alterations in the brachial artery tracings have been noted by Goldberg and his associates.[2] These mainly consist of the disappearance of the anacrotic notch or a change in its abnormal position following the Valsalva maneuver.

Sequels of Operation.—An attempt has been made to ascribe certain febrile reactions following valvular operations to rheumatic activity.[4] To classify the clinical course of the 17 patients who had a prolongation of temperature elevation in the hospital, or episodic elevations in the latter stages of convalescence, as rheumatic reactivity following aortic commissurotomy would require a diagnosis by suspicion or conjecture. Continued febrile reactions or sporadic recurrences of temperature beyond the generally accepted five day period were most commonly caused by relatively minor pulmonary complications such as retained secretions, recurrent serosanguineous pleural effusion, and pneumonitis. The periodic febrile episodes occurring after hospitalization were marked by pain in the left side of the chest on deep inspiration transmitted to the left shoulder and neck. They were not accompanied by joint pain or swelling or by tachycardia out of proportion to the temperature elevation. The heart rate returned to within normal limits when the febrile episode subsided. The illness continued for an average of 4.7 days in all patients and recurred three times in four of them. Every patient affected had required thoracentesis postoperatively and had impaired mobility of the left diaphragm at the time of discharge. Three of the patients were rehospitalized during the illness. The laboratory findings were similar to those observed in a larger group with an identical disability following mitral commissurotomy and included normal hemograms and elevated sedimentation rates, which did not persist for more than 7 to 10 days. The antistreptolysin titer was normal. In all instances antibiotic therapy was effective.

An identical clinical syndrome has been encountered following congenital heart operations. It is frequently seen in thoracotomy for pulmonary disease where there has been a significant sanguineous pleural effusion. This complication was prevalent in the early cases of mitral commissurotomy, when the technique did not permit adequate pericardial drainage. The incidence continues to be related to the adequacy of pericardial and pleural flushing after operation. The evidence outlined strongly suggests that the late febrile episodes are the result of a pleuritis or pericarditis and are related to the absorption of old sanguineous effusion.

The development of embolic accidents in the late recovery period probably resulted from the formation of left intraventricular or mural thrombi following the necessary instrumentation. Embolic issue resulting from fracture of a calcific valve was encountered as an immediate, and not delayed, hazard at surgery.

Mortality.—The mortality in aortic commissurotomy for pure stenosis is three times as great as that in mitral commissurotomy. The presence of additional valvular disease, which is insignificant, does not increase the risk of surgery. When aortic regurgitation is significant, the mortality is increased tenfold over that of mitral commissurotomy. The presence of a significant regurgitation is the most important single factor contraindicating surgery for aortic stenosis. Until that time when regurgitation can be corrected simultaneously, operation should not be performed in these patients. A definite relation between age at the time of operation and survival has been established. Operation in the groups with stenosis alone or in combination with insignificant valvular lesions has four times the mortality after 50 years of age that it has earlier. Actually, commissurotomy is carried out in pure stenosis before the age of 50 with an 8.6% mortality, less than half of the risk experienced in the entire group. When stenosis is combined with a significant regurgitation, however, age is not a factor in recovery. A gross correlation between the functional classification and survival was demonstrated for patients with stenosis alone or in combination with other insignificant valvular disease. It was not observed in the group with significant aortic regurgitation. The only exception was the survival of two patients in class 4 with pure stenosis. The mortality of patients with congestive failure on admission to the hospital was uniformly greater in all groups, regardless of the anatomic lesions. Although the mortality in all patients with angina was greater than in those without the complaint, it was not a consistent factor in determining survival. When aortic stenosis was combined with an insignificant lesion, the mortality was actually greater in the absence of angina than in its presence.

The causes of death were directly the result of operation and developed without exception at the operating table. Ventricular fibrillation was the commonest reason for death. It was listed as the primary cause only when it developed independently and spontaneously and not when it was the terminal feature of another catastrophe. This arrhythmia was four times as common in the presence of a complicating significant aortic regurgitation as it was when the stenosis was pure or when the additional regurgitation was insignificant.

Indications and Contraindications for Operation.—On the basis of the experience in this series, the indications for aortic commissurotomy may be clarified. The primary indication is the presence of aortic stenosis, which results in significant abnormality. Any combination of the subjective or objective manifestations of the lesion which is progressive is an acceptable indication, provided none of the contraindications is present. Significant aortic regurgitation and congestive heart failure are absolute contraindications. Additional insignificant valvular lesions are not deterrents. Heart failure that responds to therapy is not a contraindication if gallop rhythm is not present. The age and functional status have a direct relation to the risk of surgery, and patients in the extremes of either classification must be carefully screened. The slowly

4. Soloff, L. A., and others: Reactivation of Rheumatic Fever Following Mitral Commissurotomy, Circulation 8: 481-493 (Oct.) 1953.

progressive nature of aortic stenosis, the operative mortality, and the postoperative complications are the obvious reasons for a sober approach to aortic commissurotomy. Where indicated and when properly applied, this technique, however, has afforded relief and functional capacity to the vast majority of patients who could not obtain equal benefit under carefully regulated medical routines. Persistence in medical therapy beyond the point of proper return, or until the patient is beyond salvation by any skill, is as unrealistic as the premature and unwarranted application of surgery.

SUMMARY

Seventy-nine patients with aortic stenosis were treated surgically and followed from 3 to 20 months after operation. The operative mortality was increased in the presence of significant aortic regurgitation, age over 50 years, poor functional status, and angina. A striking improvement was observed in the key symptoms of fatigability, dyspnea, and angina when compared with the chronic state of disability which existed under persistent medical care. It is believed that an evaluation of clinical symptoms remains an important means of determining improvement following aortic commissurotomy. Clinical changes were accompanied by alterations in the brachial artery tracing and auscultatory findings which suggest improvement in valvular function.

ADDENDUM

Since this paper was written, further experiences to be reported have demonstrated that a transaortic approach to the aortic valve yields a better opening with a much lower mortality. This technique allows the surgeon to actually palpate the valve and in addition eliminates the necessity of cutting through an extremely irritable left ventricular myocardium that frequently produces various arrhythmias, notably ventricular fibrillation. To date more than 50 patients have had transaortic valvular commissurotomy, with 5 deaths. This procedure has now replaced the presently described technique.

249 N. Broad St. (7) (Dr. Likoff).

MECHANISM OF POSTURAL PROTEINURIA

Capt. Theodore Greiner (MC), U. S. A. F.
and
James P. Henry, M.D., Wright Field, Ohio

The benign functional disturbance postural proteinuria is commonly attributed to excessive hydrostatic pressure in the renal vein.[1] In his recent summary, Bull[2] assembled the evidence from the literature and from his own research supporting this viewpoint. Notable are his measurements of pressure at the renal vein of normal adults standing motionless in a position of lordosis. These ranged from 100 to 220 mm. of water in subjects who developed proteinuria and from 60 to 150 mm. of water in those whose urine remained clear. Although Bull's explanation of postural proteinuria has been satisfactory for the most part, it cannot account for the absence of proteinuria in the recent study of Farber, Becker, and Eichna.[3] In supine patients, renal venous pressure between 150 and 220 mm. sodium chloride solution, held for 30 minutes by a balloon inflated in the inferior vena cava, failed to induce proteinuria. This unexpected result raises the question whether elevated venous pressure is the immediate cause of posturally induced proteinuria. Indeed, the conflicting results are reconciled if proteinuria is related instead to the decrease in actively circulating blood volume caused by pooling of blood in the legs. It is known that the amount of fluid pooled increases as venous pressure rises; Farber's supine patients might pool blood in the legs at pressures of 300 mm. of sodium chloride solution, while Bull's standing patients could pool blood at pressure up to 1,200 mm. of sodium chloride solution. To clarify the roles of blood pooling and renal back pressure in postural proteinuria, we set out to provoke proteinuria by reducing the actively circulating blood volume and without increasing renal venous pressure.

METHODS

The subjects were six males, aged 23 to 38. No history or evidence of kidney disease was obtained except in one subject who reported an undiagnosed episode of proteinuria, followed by 12 years of protein-free urine. There was no attempt to produce a standard degree of hydration or salt balance, since we wished to test the effect of shifting blood volume at spontaneously occurring excretion rates. Maximum pooling of blood in the skin was assured by using a room temperature of 50 C (122 F) for all experiments. This general schedule was followed: After the subjects rested for 30 minutes in the hot room, sweating had commenced, skin temperature had reached 98.6 F (37 C), and one of the hour-long experimental procedures began. The four procedures were: supine lordosis with a 3 in. pad under the small of the back, venous occlusion cuffs at 80 mm. Hg on the arms and legs, tilting head-up to 70 degrees, and tilting head-up with the subject's legs encased in the Air Force antigravity suit or experimental capstan massage leggings. The order of experiments was varied, and at least three days elapsed between experiments on any one subject. Urine was collected by voluntary effort at 15 minute intervals; dead space and difficulty in emptying the bladder were sources of error in the volume of small

---

From the Aero Medical Laboratory, Wright Air Development Center, Air Research and Development Command, Wright-Patterson Air Force Base, Ohio.

1. Leiter, L.: Diseases of the Kidneys, in Internal Medicine: Its Theory and Practice, edited by J. H. Musser, and M. G. Wohl, ed. 5, Philadelphia, Lea & Febiger, 1951.
2. Bull, G. M.: Postural Proteinuria, Clin. Sc. 7: 77-108 (July) 1948.
3. Farber, S. J.; Becker, W. H., and Eichna, L. W.: Electrolyte and Water Excretions and Renal Hemodynamics During Induced Congestion of the Superior and Inferior Vena Cava of Man, J. Clin. Invest. 32: 1145-1162 (Nov.) 1953.

samples. Protein content was measured by the Kingsbury-Clark quantitative sulfosalicylic acid test. Heart rate and arterial pressure were followed throughout the experiments. When the venous occlusion cuffs were on, momentary release of one arm cuff permitted auscultation of the brachial artery. Arterial pressure was not permitted to fall; part of the pooled blood was released on the first dip in blood pressure readings or if the subject

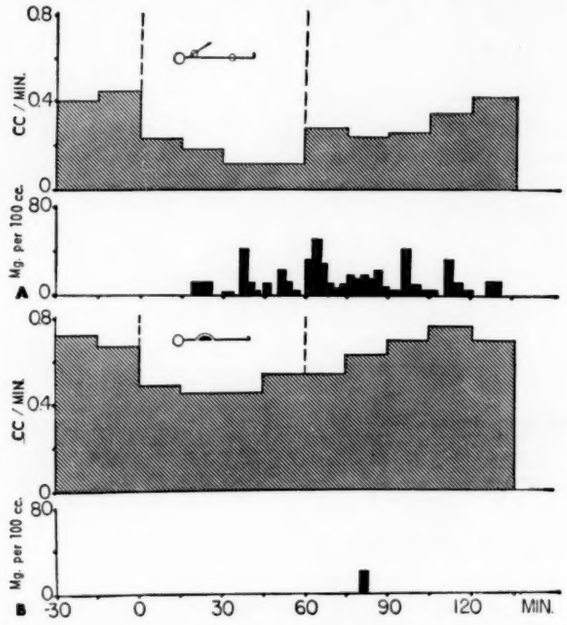


Fig. 1.—Proteinuria following a decrease of the actively circulating blood volume. Diagonal lines mark average urine flow; black bars are the protein concentration in each 15 minute urine sample from the six normal subjects. *A*, between the dotted lines blood was pooled by venous occlusion cuffs on the arms and legs, reducing the effective blood volume without lowering arterial pressure. Urine flow dwindled to 0.11 cc. per minute, and protein appeared in each subject's urine. *B*, supine lordosis, which reproduces postural obstruction of renal venous drainage, gave rise to only one specimen with protein.

felt faint. At the end of 60 minutes the pooled blood was returned to active circulation, the room was cooled to 20 C (68 F), and the subjects were allowed to drink as much water as they wished.

RESULTS

The results are summarized in figures 1 and 2. Pooling blood in the extremities with venous occlusion cuffs (fig. 1) gave protein in the urine of all six subjects. A sharp drop in actively circulating blood volume is indicated by the heart rate, which increased from 95 to 129. Systolic pressure held constant, while diastolic and mean arterial pressure rose (average control reading was 126/61, average during cuff application was 124/82 mm. Hg). Urine flow decreased during the period of blood pooling and returned almost to the original flow rate when circulating volume was restored. Protein continued to appear in specimens for over an hour. In contrast to the occlusion cuffs, supine lordosis (fig. 1) reduced the urine flow by more than one-third, but only one specimen contained protein. There was no comparable drop in the urine flow of two subjects who lay flat on their backs for two hours with the room temperature at 50 C.

The passive erect posture, 70 degrees head-up tilting, was tested in three subjects (fig. 2). Occasional movement was permitted to allay restlessness. A sharp drop in urine flow and heavy proteinuria resulted, without substantial change in arterial pressure. In another experiment the heat and tilting were duplicated in each subject, but venous pooling was prevented by rhythmic compression of the lower extremities. For this purpose two subjects wore the capstan massage leggings, which compressed the calf and thigh at skin pressure of 60 mm. Hg in a cycle reaching pressure for eight seconds and releasing for seven seconds. Instead of the heavy proteinuria, only a faint trace appeared in one specimen. The third subject was fitted with a standard Air Force antigravity suit in which bladders applied 90 mm. Hg counterpressure to the calves, thighs, and abdomen for 10 seconds, followed by a 10 second interval without pressure. No protein appeared in the urine in this experiment. Counterpressure prevented the impatience or restlessness noted during unprotected tilting.

COMMENT

The mechanism that links intermittent proteinuria with the upright posture is of general interest, though the condition itself is of little concern, except for the danger of confusing it with the proteinuria of nephritis. After

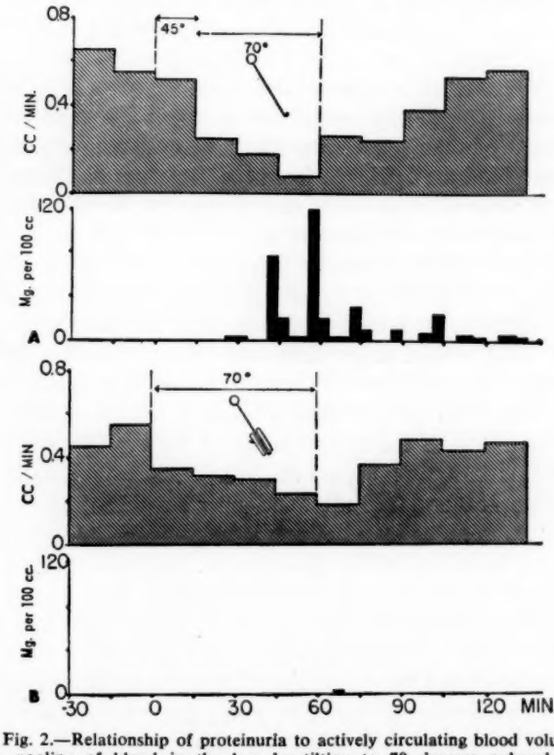


Fig. 2.—Relationship of proteinuria to actively circulating blood volume. *A*, pooling of blood in the legs by tilting to 70 degrees reduced the average urine flow to 0.09 cc. per minute and gave proteinuria in each of three subjects. *B*, the same tilting failed to induce proteinuria when counterpressure on the legs preserved the actively circulating blood volume.

the basic work of Bull,[2] lesions had been decisively eliminated and postural proteinuria established as a functional disorder of the kidney circulation. The most striking of the changes measured were acting in the renal vein. For example, if normal adults stand quietly in lordosis, those who develop proteinuria show higher pressure in

the inferior vena cava and longer circulation time from foot to tongue than is found in those subjects who do not develop proteinuria. Accordingly, Bull presumed that postural proteinuria came from elevated renal venous pressure, which in turn caused passive congestion of the kidney and proteinuria. In most patients compression of the inferior vena cava between the liver and the upright lordotic spine could account for high venous pressure.[2] However, the relation between proteinuria and transient congestion of the kidney is not well founded. Nowhere in the literature could we find experiments that support a direct relationship. The most conclusive test[3] failed to induce proteinuria at precisely the renal venous pressure predicted by Bull's hypothesis.

In undertaking to reexplore the mechanism, we were struck by the capricious distinction between normal men and those with postural proteinuria. The disorder is temporary, and its incidence varies with the vigilance of the examining physician and the harshness of his postural test. It is commonly thought to be a rare condition, yet if adolescent males are made to stand in lordosis, three out of four release protein.[2] It is not out of line, then, to study its mechanism by provoking proteinuria in normal subjects. Conclusions thus reached may provide a working hypothesis that can later be resolved in patients with the typical disorder. Our experiments confirm the dissociation of proteinuria and renal venous pressure. In figure 1, lordosis, which elevates the pressure, produced negligible proteinuria. Blood pooling by arm and leg cuffs, which lowers pressure in the right atrium[4] and to all appearances in the renal vein, gave rise to proteinuria. Another approach is offered by the tilt experiments of figure 2, where protein spilled freely when kidney venous pressure was high, but disappeared when the pressure was raised still further by compressing the legs and abdomen. The common factor that led to proteinuria was pooling of blood in the periphery, leaving a smaller volume for active circulation in the trunk and head.

With the venous side of kidney circulation eliminated, we may return to earlier suggestions that defective arterial supply causes postural proteinuria. In their original studies of arterial pressure, Erlanger and Hooker[5] connected postural proteinuria in one patient with a fall in pulse pressure, which they interpreted as a defect in vasomotor control; however, in various clinical series, neither the pulse pressure nor the level of arterial pressure bore a consistent relationship to episodes of proteinuria, and theories that involved arterial supply lost much of their appeal. Blood pressure readings remained an obstacle until it was demonstrated that blood supply to the kidney did not parallel arterial pressure. The first hint came in studies of head-up tilting, where cardiac output decreased and pulse rate increased without any decline of mean arterial blood pressure.[6] To account for these changes a compensatory reflex was postulated to control the circulation through selective constriction of certain arteries, including the renal artery, and this reflex was thought to be activated by a decreased volume of blood in the central veins. Since albuminuria sometimes accompanied the hemodynamic changes, it was suggested that postural proteinuria be regarded as a sign of circulatory insufficiency.

In later studies of circulatory regulation the actively circulating blood volume was reduced by pooling blood in the extremities with head-up tilting, venous occlusion cuffs, or pressure breathing. There were decreases in urine and salt excretion, glomerular filtration, and renal blood flow, and these functions returned toward normal when the actively circulating blood volume was restored by infusion, transfusion, or compression of the areas of pooling. In none of these studies was proteinuria reported; the drop in circulating blood volume may not have been drastic enough, or proteinuria may have been overlooked. One report did consider the actively circulating blood volume of a typical patient with postural proteinuria.[7] In erect lordosis there was proteinuria and a sharp rise of pressure in the inferior vena cava. At the same time, right auricular pressure and cardiac output fell, indicating that the vascular pool in the legs had reduced blood volume in the thorax and right auricle.

Mechanism.—The mechanism whereby a decrease in actively circulating blood volume may disturb both the circulation in the kidney and its function, to the extent of inducing proteinuria, is not yet clearly defined. It is generally assumed that autonomic reflex pathways are involved.[8] If blood volume shifts bring about a fall of arterial pressure, the carotid sinus will provide a potent source of afferent impulses. In addition, it has been shown recently that, even when the systemic pressure does not change, afferent impulses can still originate from the low pressure portion of the cardiovascular system. In this laboratory, experiments that altered the volume of blood in thoracic viscera have simultaneously changed both the frequency of vagal impulses arising from the left atrium[8] and the function of the kidney.[9] Thus they provide direct evidence for a link between events in the kidney and controlling impulses that might come from the thoracic viscera. The efferent tracts carrying impulses to the kidney are likewise controversial. The studies of Cort, in which splanchnic anesthesia prevented renal failure after a crushing injury, and those of Kaplan and others on unilateral splanchnicectomy suggest that the splanchnic nerves are closely bound up with blood pressure homeostasis. Their action, together with epinephrine mobilized by blood volume changes, provides an adequate com-

4. Warren, J. V.; Brannon, E. S.; Stead, E. A., Jr., and Merrill, A. J.: The Effect of Venesection and the Pooling of Blood in the Extremities on the Atrial Pressure and Cardiac Output in Normal Subjects with Observations on Acute Circulatory Collapse in Three Instances, J. Clin. Invest. **24**: 337-344 (May) 1945.

5. Erlanger, J., and Hooker, D. R.: An Experimental Study of Blood Pressure and Pulse Pressure in Man, Johns Hopkins Hosp. Rep. **12**: 145-378 (Aug.) 1904.

6. Asmussen, E.; Christensen, E. H., and Nielsen, M.: The Regulation of Circulation in Different Postures, Surgery **8**: 604-616 (Oct.) 1940.

7. Brigden, W.; Howarth, S. and Sharpey-Schafer, E. P.: Postural Changes in the Peripheral Blood-Flow of Normal Subjects with Observations on Vasovagal Fainting Reactions as a Result of Tilting, the Lordotic Posture, Pregnancy, and Spinal Anesthesia, Clin. Sc. **9**: 79-91 (May) 1950.

8. Pearce, J. W., and Henry, J. P.: Left Atrial Type B Receptors in the Dog, Fed. Proc. **13**: 109 (March) 1954.

9. Sieker, H. O.; Gauer, O. H., and Henry, J. P.: The Effect of Continuous Negative Pressure Breathing on Water and Electrolyte Excretion by the Human Kidney, J. Clin. Invest. **33**: 572-577 (April) 1954.

bined mechanism whereby, "the renal circulation is subordinate to the emergency function of the sympathetic nervous system." [10]

As to the intrarenal mechanics of proteinuria, Pappenheimer [11] has pointed out that it need not depend on the severe constriction of some glomeruli, with consequent ischemic damage and increased permeability. He attributes it to an increased diffusion rate of albumen as the glomerular blood flow is slowed by narrowing of the vessels. Due to the molecular sieving process, albumen concentration in the filtrate increases progressively as the flow declines, attaining plasma concentrations at zero flow. Even at normal high blood flow some protein filters through the glomerular membrane to be resorbed by the tubules. Renal vasoconstriction with tubular ischemia will decrease protein resorption at the time when increased sieving has supplied a greater load. The reversible onset of increased protein filtration and decreased resorption are in themselves sufficient to account for proteinuria following reflex disturbance to the kidney circulation. We would then propose the following hypothesis for the mechanism of postural proteinuria. Proteinuria results from renal vasoconstriction, part of the compensatory reflex that maintains arterial pressure at the expense of visceral circulation. The reflex is initiated by reduction of the actively circulating blood volume, especially that filling the thoracic organs. The essential defect in postural proteinuria is probably the size of the venous reservoirs that pool blood volume, as suggested by the increased circulation time,[2] though there may also be hyperactivity of the circulation-controlling reflex. More extensive pooling in the afflicted patients could result from compression of the inferior vena cava [2] or from vasomotor instability.[5]

Characteristics.—Certain characteristics of postural proteinuria, not readily explained by venous back pressure, now becomes obvious. Its great predilection for hot weather [2] follows from the vasodilation of skin vessels. Motionless standing is much more effective in precipitating proteinuria,[2] since slight movement puts to work the venous pumping action of the leg muscles and restores the actively circulating blood volume. Again, the high incidence of postural proteinuria in young males, and its disappearance with maturity, may be linked closely to the vasomotor instability of adolescence, instead of resting uneasily on hypothetical changes in spinal configuration. Lordosis, either erect or supine, gives rise to venous pooling and proteinuria by obstructing the vena cava; kyphosis prevents proteinuria not only by straightening the major venous channels but also by compressing the potential venous pools in the abdomen and buttocks. Pressure on the abdomen may induce proteinuria when the legs are free to store the dammed fluid, whether this pressure is external from a bladder [12] or internal from a fetus.[13] Abdominal compression by an antigravity suit, which does not permit pooling in the legs, failed to induce proteinuria in our one trial.

Finally, this concept of blood pooling relates postural proteinuria to the other intermittent proteinurias, foregoing arbitrary classification such as lordotic, nonlordotic orthostatic, and nonorthostatic benign as with exercise. These proteinurias may operate through the same mechanism but differ in their means of reducing the actively circulating blood volume and thereby kidney blood flow. Likewise, proteinuria joins the growing list of circulatory afflictions that may be induced by postural pooling of blood volume. The best known, postural hypotension, has been related to pooling from loss of reflex venous tone [14] or as induced by drugs, where it limits the utility of antihypertensive agents,[15] and of atropine in doses given as a nerve gas antidote.[16] Other penalties of the upright posture are tachycardia and syncope,[7] attacks of cyanosis and dyspnea in tetralogy of Fallot,[17] and paroxysms of pulsus alternans,[18] all of which have been traced to the pooling of blood in the legs.

SUMMARY AND CONCLUSIONS

Proteinuria was induced in six normal adult male subjects while they were exposed to a room temperature of 50 C (122 F) by pooling blood in the arms and legs or by using a 70 degree head-up tilt. Oliguria accompanied the proteinuria, but mean arterial pressure did not fall. Proteinuria was not induced in the same heat by recumbent lordosis, with its accompanying increase in renal venous pressure, or by tilting to 70 degrees, if the legs were mechanically massaged to prevent the pooling of blood. It is suggested that postural proteinuria results from renal vasoconstriction, reflexly initiated by a decreased blood content of the thoracic viscera.

10. Smith, H. W.: The Kidney: Structure and Function in Health and Disease, New York, Oxford University Press, 1951, p. 459.

11. Pappenheimer, J. R.: Passage of Molecules Through Capillary Walls, Physiol. Rev. **33**: 387-423 (July) 1953.

12. Bradley, S. E., and Bradley, G. P.: The Effect of Increased Intra-Abdominal Pressure on Renal Function in Man, J. Clin. Invest. **26**: 1010-1022 (Sept.) 1947.

13. Simon, H. J.: Orthostatic Albuminuria Developing Late in Pregnancy, Am. J. Obst. & Gynec. **48**: 717-719 (Nov.) 1944.

14. Page, E. B., and others: Reflex Venomotor Activity in Normal Persons and in Patients with Postural Hypotension, Circulation **11**: 262-270 (Feb.) 1955.

15. Restall, P. A., and Smirk, F. H.: Regulation of Blood Pressure Levels by Hexamethonium Bromide and Mechanical Devices, Brit. Heart J. **14**: 1-12 (Jan.) 1952.

16. Miller, R. D.; Kalser, M. H.; Frye, C. W., and Gordon, A. S.: Measurement of Atropine-Induced Vascular Pooling, Circulation **10**: 423-429 (Sept.) 1954.

17. Lurie, P. R.: Postural Effects in Tetralogy of Fallot, Am. J. Med. **15**: 297-306 (Sept.) 1953.

18. Friedman, B.; Daily, W. M., and Sheffield, R. S.: Orthostatic Factors in Pulsus Alternans, Circulation **8**: 864-873 (Dec.) 1953.

Hysteria.—A symptom without demonstrable organic basis may be a manifestation of several psychiatric illnesses. It represents a conversion reaction when it presents an alteration in function of part of the body innervated by the voluntary nervous system and when it serves an unconscious purpose for the patient. Typical features of the conversion reaction are: (1) predisposing "hysterical personality"; (2) symbolic meaning of the symptom; (3) possibility of the symptom being an elaboration of organic defect; (4) disparity between findings and anatomic fact; (5) relative indifference of patient toward symptoms; (6) production of symptom by stressful situation; and (7) background of sexual inadequacy. Treatment includes psychotherapy directed toward those underlying personality traits which lead to the production of symptoms. The removal of the presenting symptom may be accomplished by suggestion enhanced by pharmacological agents or hypnosis.—Lieut. (j. g.) J. C. Westman (MC), U. S. N. R., Clinical Aspects of Hysteria, *United States Armed Forces Medical Journal*, March, 1955.

PSYCHIATRY AND THE FUTURE OF MEDICAL EDUCATION

Francis J. Braceland, M.D., Sc.D., Hartford, Conn.

It is probable that when the campanion structures of this great new Mayo Memorial were dedicated there was no mention of psychiatry at the exercises and no idea that some day it would have an important part to play in both medical education and a changing medical practice. Actually, there was little reason for considering psychiatry at all for what there was of it was isolated from medicine and in the hands of alienists. This designation was apt and fitting, for, in addition to its accepted meaning, it symbolized the isolation of these practitioners from their medical colleagues. Today, as this new monument to medical progress is dedicated, medical education is in transition, and it would not be altogether strange if psychiatry were to become one of the foundation stones of the new "integrated medicine," which is at present under pilot study in the medical schools. There is little need for recounting the course of psychiatry in medicine in the last half century. Medicine was immersed in its newly found scientific phase, and, while building its edifice on the basic physical sciences, it saw no need for attention to disciplines that savored of being "unscientific"—in fact, the word "unscientific" had assumed the connotations of an epithet in some medical circles. Psychiatry was to have no trouble at all in qualifying for a place in the "unscientific" category; in fact, it might have taken first prize, for not only was it 50 years behind general medicine but vague and foreign metaphysical leanings were beginning to appear in its doctrines. This was reason enough to condemn it on two counts and to further isolate it from the main body of medicine.

It was not until World War II, with its widespread emergence of mental and emotional ills that psychiatry really attained its present level and full professional recognition. When it became evident under the stress of war that emotional disorders might act as noxious agents and that men affected by them might be rendered just as ineffectual as if they were seriously wounded, then the need for psychiatric understanding was recognized. Scientific medicine, which had made such notable strides in the prevention of disease, in the treatment of wounds, and in various other directions, was all but helpless in the face of emotional problems, and, on this basis, the psychiatrist was admitted to condition fellowship with his medical confreres. Strauss,[1] in commenting on the position of the psychiatrist, *vis à vis* his professional colleagues in other branches of medicine, has said: "The modern psychiatrist presents a challenge; and the attitude to him is curiously ambivalent; at the same time as he is regarded with a considerable measure of suspicion and accordingly comes in for a fair amount of (sometimes rather ill natured) banter, he is quite confidently expected to work therapeutic miracles, and in double quick time." Then Strauss adds: "and strangely enough he often comes up to expectation."

Meanwhile, as this drama was being played and as medicine was accomplishing its prodigious feats, there were other forces at work—outside of the field of medicine and science but destined later to exert powerful influences on both. These forces were in the social and economic spheres, areas traditionally avoided by physicians and scientists alike and considered by both to be of little concern to them. There had been intermittent rumblings about difficulties in these areas for years, but not much attention was paid to them. It is said that even at the turn of the century Oliver Wendell Holmes had warned a medical group that the practical men who had no leisure to watch the currents running "this way and that" were also carried in these currents and "their work might go for naught if they failed to recognize the laws which governed their changing practices." It was essentially a reiteration of John Donne's famous statement that "No man is an Iland intire of its selfe," applied to medical practice, and before long the debacle of a once proud, far-advanced middle European medicine was to bear witness to the wisdom of these solemn warnings.

Here were two different currents—both slowly carrying the physician in new directions—the one concerned with emotional problems, the other influenced by social, cultural, and economic tides. The trends that carried the physician far along scientific paths seemingly concomitantly had dimmed for him knowledge of the leavening and liberalizing influences of the humanities and failed miserably to properly emphasize the importance of emotional and environmental influences in illness. This was indeed unfortunate and not at all necessary, for scientific and empathic understanding of illness are not mutually exclusive. In fact, some of the great teachers of medicine, men whom medicine revered, were men with classical educations and were great because of their skill in combining scientific medicine and a humanistic approach to their patients' problems. As the situation is reviewed from the present vantage point, it is seen that little could have been done to alter the course of events and it seems to have been destined by the fates for difficulty. The culture of the past half century was frankly and openly mechanistic and materialistic, and some of it was bound to rub off on medical practice. Medicine moved in stages from a family type of practice through the laboratories into highly specialized and highly scientific approaches to the problems of illness. At present the very latest experiments in medical education are concerned with the student gaining knowledge of family practice. This is a complete turn-about, and in it we are following in the footsteps of the physicists who, after giving the ingredients to blow man up and to leave no earth for the meek to inherit, now have become spiritual and want their brain child controlled.

During the sojourn into the purely scientific realm in the past four or five decades several things have happened, and one is that physicians collectively have had a slight

---

Psychiatrist-in-chief, Institute of Living.

Read at the dedication of the Mayo Memorial Building, University of Minnesota, Minneapolis, Oct. 21, 1954.

1. Strauss, E. B.: Reason and Unreason in Psychological Medicine (Croonian Lecture), Lancet 2:49 (July 12) 1952.

fall from public grace and even slipped a notch in the affection of the people. This has had widespread repercussions, even extending to influence on the number and quality of the students who are applying for admission to the schools. Never before have physicians been possessed of such a high level of scientific knowledge and never before have they been the object of such severe criticism. It is in line with this criticism that they are in danger of having their practice interfered with by forces that are either unaware of, or unmindful of, the damage they could do to an honored profession. There is today a low state in medicine's relations with the public. It is axiomatic that persons do not get angry at medicine in general or individual doctors because of scientific inadequacy. Rather, they get angry because of rejection, real or fancied, slights, or lack of consideration. If the omens and portents are to be read correctly, the people are angry now, and medicine will get the blame for any economic situations that it has nothing to do with. Some form of regulation is in the offing, and there is no telling of the degree of damage that will result.

There are these and other currents in motion that make imperative a reexamination of the methods of training and education. With an increased life span and increased life expectancy, people are living long enough to develop chronic diseases and geriatric disorders. These, plus a plethora of emotional disorders, may constitute the bulk of future practice. Therefore, not only is the treatment of disease changing, but disease itself is changing and this is the situation that confronts us in midcentury with the freedom, progress, and future of medicine in the balance.

MEDICAL EDUCATION IN TRANSITION

To suggest a new orientation for medical education is not to imply in any way that it has been a static process in past decades. Progressive changes in curriculum have been made when deemed necessary. True enough, the pattern of rigid separation of preclinical and clinical subjects has been the general rule probably to the disadvantage of the student. The need for proper grounding in the basic sciences is admitted, but, without knowledge of its eventual clinical applicability, it becomes simply an exercise and a prodigious feat of memory. Stetten,[2] in commenting on this, states that it produces confusion in the mind of the students, forced, as he says, to commit to memory without the only valid mnemonic device in medicine—the patient. "As a result," he says, "a large proportion of the students feel that preclinical subjects represent a hazard interposed between them and the study of medicine by an unsympathetic and uncomprehending faculty." He believes that a drastic rearrangement of time is called for between the teachers in the preclinical and the clinical years and a form of cross fertilization is necessary between them. To this, one more admonition is added. It is understood that in some schools in the preclinical years anxiety and fear is still the order of the day. Students are warned openly or covertly that there is room for only a portion of them in the next class. This is unfortunate, and it makes for an atmosphere that is not productive of good substantial work.

As to the clinical years, there have been vast improvements, but only too often they had to be made over the strenuous protests of specialists, each convinced that his particular subject was the alpha and omega of all medical practice. The graduates of several decades ago well remember the long, tedious, and fruitless hours spent in amphitheaters, straining to see the techniques of intricate procedures that they would never use and that, perchance within a short time, would become completely outmoded. The fact was lost sight of that these students were for the most part to enter the practice of general medicine and to deal with the mundane problems of people buffeted by numerous economic, social, and emotional pressures.

This is in no way an unredeemed critical appraisal of the educational procedures for, I believe, like Collings,[3] that:

> When all possible criticism has been leveled at modern medical education and those responsible for it, we are left with one indisputable conclusion, that the average graduate from an approved medical school who has had an approved hospital training is versed in the basic clinical disciplines essential to the conduct of a sound and safe general practice. He knows how to approach a diagnostic problem and how to carry out basic therapy and he knows his limitations. With all of his skills and all of the knowledge at his disposal the young doctor has the makings of an excellent general practitioner and with the accumulation of experience he should become just that.

Collings holds, and I am in complete agreement, that it is the conditions the young physician encounters—the economic and social situations he finds when he enters practice—that lead him to neglect some of the things he has learned in medical school. One of the major problems that faces medical educators, therefore, is the preparation of the student not only for the scientific understanding of disease processes but also for the community practice of medicine as he will encounter it.

My particular concern in this presentation is with the preparation of the student for the understanding and treatment of the emotional problems that will be presented to him in his practice, whether frank and open or covert and masked by somatic symptoms. This has been done rather well in some of the schools of late, and there is more general agreement concerning the importance of understanding the neuroses, even though many physicians still have doubts about psychiatry as a body of scientific principles and working hypotheses. In an ever-increasing proportion of illnesses, emotional pressures and modifications of the patient's way of life are becoming the important concern of the physician, and it is only recently that the impact of this fact on the profession in general was noticeable. Rappleye[4] stated this in his opening remarks in a symposium on medical education: "We are becoming more and more appreciative of the fact that the care of most patients and families involves a number of broad social and economic problems and the psychological emotional problems of individuals. Medicine today is as much a social science as it is a biological science. It is responsible not only for the individual patient but for the whole field of medical care."

2. Stetten, DeW., in discussion on Atchley, D.: The Effective Modern Development in the Science of Medicine upon the Undergraduate Curriculum, in Trends in Medical Education, edited by Ashford, M., London, the Commonwealth Fund, 1949, p. 66.

3. Collings, J. S.: Making the Doctor—The Need for a New Educational Approach, J. M. Educ. **28**: 19 (Sept.) 1953.

4. Rappleye, W. C.: Introductory Remarks, in Trends in Medical Education, edited by Ashford, M., London, England, the Commonwealth Fund, 1949.

Naturally, these directions in which medical education seems to be going do not meet with universal approval in the profession. Already capable clinicians have decried the trends that are becoming evident. They hold that medicine after 30 years has finally become a science and that science must be the watchword in the training of students. They express concern with the present emphasis on the emotional and social aspects of the patient's problems and fear that it will introduce "do gooder" factors that will deviate and set back scientific medicine in general. Peculiarly enough, those clinicians who are decrying present trends are men who themselves are particularly well equipped and sensitive to emotional and social influences in the illnesses of their patients. They recognize these pressures instinctively and allow for them. They are equipped naturally and instinctively with warmth and understanding. They do not realize that it might be necessary to accent these factors for persons who are lacking such qualities or who have lost sight of them or had them trained out of them in the urge of their teachers to make them ultra scientific.

These various stirrings and movements have lead up to the experiments in medical education that are today being tried in various medical schools throughout the nation. All of these alterations in curriculum are noteworthy, for they are predicated on an integrated approach to the illnesses that beset man. They imply that one cannot treat man as a problem without some attention to the problems of man. Of particular importance from our point of view are those segments of the experiment in which the student is assisted in learning by being assigned to a family early in his training in order to see what it means to be the real doctor of a real family, aware of all its conflicts and its pressures and the influence of these on the health of its members. To learn about people in this manner does not mean to sacrifice scientific knowledge. It means the proper utilization of scientific knowledge. The students are stimulated to pursue rather than neglect a thorough scientific understanding of the difficulties they encounter, and, by their efforts, they integrate the school and the hospital with the community. Undoubtedly out of these combined experiments in medical education there will come sufficient information to indicate the directions the medical education of the future will take.

COMPREHENSIVE MEDICINE

The truth of the observation that every discipline that relates to people is influenced by many factors and that no art or science stands alone is obvious. There are reciprocal influences between individuals and families, groups and society, and medicine and the society in which it operates. This all indicates the need for an integrated form of medical practice, a comprehensive medicine that has for its purpose not only the return of the patient to optimum physical and mental health but also his return to society as a normal functioning person. One method of approaching this desirable end is to readjust the medical curriculum on a broad scale. Perhaps the word reorientation would be better, for it does not imply the inclusion of new disciplines into an already overburdened curriculum. It simply means the accentuation and use of some facets that are already present in the medical curriculum and an effort to better understand human behavior and the factors that influence it. In reality, it means a willingness to evaluate the influence of social behavior and dynamics on the patient's health and an attention to these neglected but essential facets of medical practice.

The method of presentation of the concept of comprehensive or integrated medicine to the student and practitioner, or indeed to the educators themselves, will be of the greatest importance. Approached properly, it should have wide acceptance; approached without properly laying the groundwork, it will meet with even mo e difficulty than did its predecessor, psychosomatic medicine. Despite all criticism, this latter is an excellent method of approach to medical practice, for there can be no medical practice, including psychological medicine, that is not psychosomatic if it deals with people. The human being of necessity is a person who is constantly involved in psychological, biological, sociologic, and economic processes and adjustments within the framework of his environment. In other words, man is a social animal whose accomplishments and frustrations arise in his relationships with other people "and his day-to-day living is carried on securely or insecurely by the motivation of his interpersonal attitudes and sentiments." [5] To treat his ills requires attention to all of the vectors that influence him and, thus, a comprehensive approach is a natural evolution of medical practice.

If two of the powerful forces influencing general practice and, therefore, a large proportion of the medical care of the population of the United States today are social and economic, the directions of medical education are thereby strongly determined. If the young physician must be properly prepared to solve the problems he encounters in his daily work, then the medical schools are called on to include some consideration of the effect of these problems on the patients' health. Comprehensive medicine, therefore, will be directed toward the training of the complete physician, preparing him to understand, not only the physical ills of each person, but also his personal problems that necessarily have a strong influence on his reactions and recovery from these illnesses. The idea is not to strive to train a super specialist and not one trying to be all things to all people, but rather to train a true physician with broad medical knowledge, scientific and humane in outlook, and able to understand the influence of all extraneous factors on the making of symptoms. Naturally such training will include a broad experience with psychological and preventive medicine and yet this must be done with only moderate alterations in medical training programs, even as has the new accent on rehabilitation been inculcated without major disruptions in the general curriculum. It has been learned from experience in psychosomatic medicine that the personality of the patient can be used as an extremely important therapeutic agent, even as powerful as a potent drug. Through the assistance of the wise physician there is a liberating of curative attitudes and a stimulation of the patient toward the development of his own resources. It is the training task of the future to develop such capa-

5. Whitehorn, J. C.: Basic Psychiatry in Undergraduate Medical Programs, in Trends in Medical Education, edited by Ashford, M., London, England, the Commonwealth Fund, 1949.

bilities in medical students to make them as effectual as the old family doctor, yet to base their therapy on a scientific foundation.

PSYCHIATRY IN COMPREHENSIVE MEDICINE

To approach the medical educators with plans that call for increased curricular hours is to risk the same fate as would plans that call for additional funds. They are automatically suspect and probably marked for failure. Therefore, the psychiatrist who comes to his colleagues with plans for the teaching of comprehensive medicine must have some idea as to how its basic doctrines can be integrated into the present curriculum. With half of the hospital beds in the United States occupied by patients with mental disease and with a quarter to a third of the budget of several of the larger states allotted for this hospital care, it would be shortsighted to minimize the importance of consideration of the psychoses in medical teaching. Actually, however, this emphasis belongs in the graduate years, for the undergraduate has something even more important to learn from the psychiatric standpoint. It is said that a large portion of the practitioner's work is concerned with emotional reactions and emotional influence on somatic symptoms, and, if this is true, then by all odds the student must be well grounded in the understanding of these reactions. It is present practice for physician and student alike to sharply demarcate the functional from the organic, but nature is either not aware of, or refuses to stay within the bounds of, this demarcation.

That there are neurotic elements in organic illness is well recognized, as is the fact that there are somatic accompaniments to the various neuroses. The question is not, whether the problem is organic or functional in nature, but rather, how much of each is involved. Though the statement: "It is just as important to know who has the disease as it is to know the disease he has," has been repeated so often that it has become a cliché, the statement is still true, and it should be kept in mind. Actually the student should come into medical school as well prepared in the knowledge of the psychological reactions as he is in the physical sciences. He usually is not so prepared. Lacking this knowledge it is the physicians' task to present it to him in his first year, along with the other basic medical sciences. Psychiatry, therefore, from the beginning should be taught as a basic science and not an isolated specialty, for it has a fundamental contribution to make to the subject matter of all departments of medicine and medical education.

It is not intended to delineate the hours or the details of the integration of psychiatry into the curriculum with medicine and the various specialties. Each school will choose the method that is propitious.[6] In some schools, including this one, the integration has already been given a trial—here need only be mentioned the broad outlines suggested by various authors. Instruction in the first year of medical school should be directed toward unfolding of normal personality development and functioning. This is the propitious time for it, before the student becomes entirely case hardened and mechanistic, and it should mark the beginning of the integration of the knowledge of humanistic factors in illness that will last not only throughout the whole medical curriculum but also throughout the whole medical career. In the second year the student is prepared for the application of this knowledge in the instances of patients who are having difficulties in emotional spheres. At this time he also learns the fine points of interviewing and the far-reaching effects of the physician-patient relationship. He becomes aware of the fact that behavioral difficulties are far more quantitative than qualitative, and he begins to catch some of the crumbs that fall from the table in the way of self-knowledge and understanding. This teaching should be in conjunction with the early instruction in physical diagnosis, and it is accomplished as a close cooperative venture between the departments of medicine and psychiatry with instructors from both in each teaching group.

In the third year there will be clinical clerkship in psychiatry, work in the various outpatient departments, and further understanding of neurotic manifestations as evidenced in the illnesses seen in the clinics of all medical specialties. There is the learning that neuroses are not fixed entities—that they are ways of reacting that everyone evidences in some degree at some time or another—and they are, as it were, universal modes of reaction. The third year might even be the correct time to suggest that the emotional upsets of both the man and the woman in middle life and old age should be taken care of by the general practitioner or the physician who knows the patient best. As these illnesses increase this need may become more and more evident. Certainly the mild anxieties and minor depressive reactions come within the purview of the general medical man, and this is the time to begin his training in the understanding of them.

In the fourth year then is the required period of clerkships, and the main segment of this work should again be done on the general hospital wards and under the direction of the department of medicine in close cooperation with the department of psychiatry. There is also the elective course in the psychiatric hospitals, with the understanding that the purpose is not to categorize psychotic patients but to observe the mechanisms that motivate these persons and to apply that knowledge to the student's day-to-day relationships with patients.

Ebaugh and Barnes [6e] outline the details of the integration of the psychiatric segments of the program in their annual review of the subject in much better fashion than can be attempted here. They state that there is general agreement that psychiatric teaching of undergraduate students should be aimed toward the following objectives:

1. Teaching them to interview patients intelligently, taking into account their economic and social status in order to gain comprehensive understanding of the person regardless of what the presenting problems might be.

2. Inculcating the ability to evaluate correctly the condition of patients with emotional disturbances whether expressed as physical, psychological or social symptoms.

3. Teaching and understanding what the non-psychotic practitioner can and should do, not only in the emergency management of disturbed patients but treatment of emotionally healthy people who are physically ill.

6. (*a*) Whitehorn.[5] (*b*) Report on Medical Education, Group for Advancement of Psychiatry, Report no. 3, March, 1948. (*c*) Rennie, T. C., in a discussion of Whitehorn.[5] (*d*) Ebaugh, F. G.: Psychiatric Education, Am. J. Psychiat. **106**: 545 (Jan.) 1950. (*e*) Ebaugh, F. G., and Barnes, R. H.: Psychiatric Education, ibid. **110**: 539 (Jan.) 1954. (*f*) Aldrich, C. K.: Psychiatric Teaching on an Inpatient Medical Service, J. M. Educ. **28**: 36 (June) 1953.

4. Give the general practitioner information about what he can do and should not do in the treatment of the mentally ill. A healthy development is the teaching of the awareness of psychological problems in the non-psychiatric departments of the medical school.

Thus the appeal is not for more hours for psychiatry set off by itself, but rather for more coordination with other branches of medicine or pointing toward that felicitous time when each specialty will be thoroughly familiar with the emotional aspects of the problem and capable of handling them. Lindeman[7] reminds us: "The community feels justified in carrying to the physician, anxieties, tensions and conflicts in interpersonal relationships. It is justified in doing so. But if the physician is to assume this role as a special authority in the community he must have a thorough background in both psychiatry and neurology." The beginnings of this training must be established in the undergraduate days.

COMMENT

It is recognized that in this presentation not only the problem has been oversimplified but the fault has been committed of discussing only a psychiatric approach to the problem of "integration" at the undergraduate level. These faults are made necessary by the exigencies and time limits of the occasion. In order to present a more definitive method of attaining a comprehensive form of medicine the findings and the recommendations of the various pilot programs now in progress in the medical schools will have to be awaited. The mere fact that these programs are going on and there is nationally a recognition by medical educators that there is a need for extensive reorientation in the medical curriculum is a major step forward. Undoubtedly some of the work to be done in this new Memorial Building will further the concept of comprehensive medicine in medical education and medical practice. Psychiatry will play an important part in this and perhaps be the mortar that will hold other approaches to the patient together. It should be kept in mind that this specialty started 50 years later than the others, but its progress has been faster than any of the others. Its future is intimately tied to advances in medicine.

Lest any of this dissertation seem to be critical I hasten to disclaim that attitude. I am in complete admiration of the work the medical educators have thus far accomplished. With this attitude, I would say to you as did Burton in "Anatomy of Melancholy": "I will urge these cavilling and contumelious arguments no further lest some physician should mistake me and deny me physic when I am sick." Like Burton I am well persuaded of physic and like Bacon I hold myself a debtor to my profession. Our profession is made lustrous and immortal by those who have gone before us; by men of the caliber of the Mayo brothers in whose honor this structure rises today. I hope that those who are sent forth from here may each bring credit and conduct themselves in a manner so that it might be said of them as it should have been said of Dr. Will and Dr. Charles, "When the eye beheld them it lighted with pleasure, when the ear heard them it was joyful because of their wisdom and when they bestowed their magnificent presence upon people, the people blessed them and were made better in the process."

200 Retreat Ave.

7. Lindeman, E.: The Role of Medical Education in Modern Society, Am. J. Psychiat. **109**: 89 (Aug.) 1952.

THE ART OF NURSING

Lucile P. Leone, R.N., Washington, D. C.

Albert Schweitzer recommends that when talking of an art one speak in parables. About the art of nursing I would tell you the story of my young friend Joe and the nurse who cared for him at a critical time in his life. Joe was born with a defect in his trachea. It could not be corrected by surgery until he was 18 months old. At that time came hospitalization and then the day of operation. His evening nurse found him just out of the anesthetic, sobbing, tossing, frightened at the strange new way of breathing. She searched the ward to find a rocking chair for his room. Before it she placed a table holding the electric suction pump and the tray of equipment for clearing the tracheotomy tube. She sat all night with Joe in her arms. Frequently she leaned forward in the chair to turn the switch and apply suction to Joe's tube. Secure in her arms, Joe slept fitfully. Freed from his preoccupation with fear, soon he began to associate the whir of the motor with relief from choking. The nurse noticed that even before she could detect that breathing was difficult he would turn his eyes and make small gestures toward the table. She began holding his fingers over the switch when she turned the motor on. By morning Joe had learned. When the tube needed clearing he would stir and reach. She rocked forward, he turned on the switch, and she applied suction to the tube.

When Joe was 3 years old I visited the family. As his mother and I sat chatting I heard the kitchen screen door bang, running footsteps to a bedroom, and then a whirring sound. At my question his mother said "Yes, Joe still has his tracheotomy tube—soon he can get along without it. Ever since he left the hospital he has known how to suction it out himself. He seldom needs help. He plays actively with other children and runs into the house when he needs to clear the tube. He never thinks of himself as handicapped." And I thought—suppose on that night more than a year ago his nurse had used a restraining sheet instead of a rocking chair.

Joe's story illustrates two major characteristics of the art of nursing—its meeting the needs of each patient and its working for maximum effect of the treatment program of the physician. The two are inseparable. Joe needed

Read at the dedication of the Mayo Memorial Building, University of Minnesota, Minneapolis, Oct. 21, 1954.

Chief Nurse Officer, Public Health Service, Department of Health, Education, and Welfare.

security and love when fear and panic threatened him and when he was deprived of mother-closeness. He needed relief from sobbing. He needed skillful clearing of his tracheotomy tube. He needed to start the foundation of his adjustment to living with the tube and the attention it would require. He needed to feel power over this mechanical device rather than let it have power over him. He needed minimization of the psychological trauma of that dramatic episode in his life. The nurse did not meet Joe's needs intuitively but from the deep knowledge of how personalities develop. She understood Joe's emotional reactions to threats to breathing and to restraint. She knew her own anxiety or her sureness would be communicated to him. Her understanding encompassed a long time span, and the relationships between what happened today to what could happen next year were clear.

RANGE OF VALUES

Nursing is an art with a wide range of values. In some situations nearly the full range of values is reflected in practice, many of the values intensively. In other situations the range is more limited and some of the values are evidenced only superficially. I would like to list some components of nursing practice found within this range. Nursing can focus on rehabilitation as well as therapy and can find the rehabilitation potential in the first contacts for therapy. It can attend to emotional needs as well as physical needs and to the fact of their interrelatedness. It can foster prevention without inducing guilt at illness. It can take account of the family and community setting of patients' problems and can see the illumination of the cultural heritage on behavior. It can teach health practices to patients and can be sensitized to the acceptability and effectiveness of such teaching to patient and family. It can comprehend the magnitude of specific health problems—the organized movements to solve them—and can see each patient's problem in this larger setting. Nursing can be organized in terms of individualized patient care rather than in an assembly line of like tasks for many patients. In clinical research, nursing can welcome the meticulous grinding repetition and the demands for accuracy in action, observation, and reporting; and it can sense the thrill of discovery. It can master new and highly complicated techniques and understand their scientific basis.

Whether the range of values in nursing is wide or narrow depends upon the nurse and her preparation, upon the vision of the nursing administration in which she operates, upon the expectations of medicine, and upon institutional or agency policy. Most persons in the medical profession have the conviction that people will be better served when nursing, with a wide range of values, reaches them. When nursing is limited to mere technical skill, patients can be treated with dispatch, but some of them will be little Joes crippled by the restraining sheet.

PATIENT-NURSE RELATIONSHIP

It is paradoxical that, at a time when the patient-nurse relationship is increasingly recognized as a therapeutic instrumentality, one should find that professional nurses spend less time with patients. Hospital design and modern manners place each patient in a room to himself, and he sees his nurse only when she enters that room. And now these times are reduced by installing two-way communicating systems. Of course, no one could object to saving steps; one might, however, advantageously devote the time that is saved to longer patient contacts. A short time ago a patient told me how much he had enjoyed being in a room with five other patients. His emergency admission had found the hospital with no vacant single rooms. He said, "Almost all the time I could see a nurse. Her presence comforted me. I could almost feel the comfort when another patient's back was rubbed." Perhaps hospital planners can find a way to combine necessary quiet and privacy with visability, accessibility, and shared comfort.

The professional nurse's relationship with patients is diluted when nonprofessional personnel are added to the nursing staff. This dilution is compensated for by organizing a combination of personnel, professional and practical nurses and aides, into a team caring for a group of patients. Two weeks ago in a hospital I observed a team conference, one of the conferences held daily by each team. It was a means by which the professional nurse captain of the team was informed of where the patient stood that day and through which she achieved a higher base for her necessarily brief contacts with the patients. It was a means by which information was shared on conditions of patients each team member observed and all team members should know. Communication in this conference was facile and rapid; nor was it accidentally so. Expert leadership in communication and in creating a cohesive force in the team was easily apparent in the nurse captain.

On that same day I observed a conference at which a physician discussed patient problems with the members of a nursing team. Nurses asked questions freely, showed understanding of a wide gamut of problems, and reported many pertinent observations. The doctor explained the goals of therapy and each patient's responses. All the patients involved were research patients, and their attitudes toward research and the yearnings of some of them for the miracle were the principal subject of discussion that day. Here was another example of easy and rich communication, filling in the gaps that seem almost inevitable in a highly complex situation. The physician commented afterward that he was involving the interns and residents in these conferences so that they could have experience in communication by conference, not because he wanted to improve nursing care, but because he wanted to improve care, both medical and nursing.

The nature of the nurse-patient relationship changes with progress in medicine. In more and more situations one finds patients encouraged to participate in their own therapy. The story of Grandma Brown illustrates one facet of this statement. Grandma Brown had come very reluctantly to the hospital for a rather simple operation. On the day after operation the nurse had her sitting on the edge of the bed and on the next day standing on the floor; on the third day, with voluble protests, Grandma Brown took a few steps, and in another few days she was able to shuffle down the corridor with the aid of only a handrail. She had made such a fuss about all this that on the day of discharge the nurse alerted the cashier to expect complaints from the son when he came

to pay the bill and take her home. Checkbook in hand, Mr. Brown said he would gladly have paid twice the amount charged for the hospitalization. Taken aback, the cashier murmured something about its having been a very successful operation, whereupon Mr. Brown said, "Oh, it isn't the operation, it's the walking—mother hadn't been out of bed for six years."

Engaging the patient's own efforts in therapy changes the nurse-patient relationship. We nurses do not do to patients as if we were their custodians, nor do we do for patients as if they were our dependents. Rather we do with patients, leading them to increasing self-direction. Graduating the degrees of dependence and independence becomes another feature of the art of nursing and another aid in the progress of medical care.

FOUNDATION

Nursing, that art, is becoming increasingly self-analytical. Studies of management and utilization of types of nursing personnel feed back into the content of nursing and its administration. A gap will remain in these and other nursing researches, however, until some objective criteria of the effect on patient welfare of differences in nursing care are defined. When such criteria are available, patterns of nursing service can be selected more wisely. Physicians can be more knowing in their prescriptions of nursing care as a form of therapy. Hospitals could then be more definite about the quality of care for which they stand. Perhaps how much each of the values of nursing care pays off and whether hospitals could afford rocking chairs could be learned.

Nursing is an art practiced in a scientific and humanitarian setting. I say little about the scientific foundation of nursing, because I believe that in every paper presented in these two days that contains the word "patient," the implication of scientific principles for nursing will, if one stretches imagination, be apparent. As for the humanitarian tone of the setting in which nursing is practiced, one need only think of this building in which nursing will be practiced and the cause to which it is dedicated. It exemplifies, too, the impossibility of conflict between the scientific and humanitarian aspect of the healing arts. But lest you think I expect a nurse to exercise only her educated heart in the practice of the art of nursing, I must say that, of course, nurses must be expert in giving medicaments and treatments, in observing gross and minute responses, in manipulating simple and complicated equipment, and in creating barriers to the spread of infection. Their hands must be deft and gentle and quick. A nurse must weave a hundred details, some bits of care given by herself, some by others, into an integrated whole—into care that is whole in the patient's eyes as well as on the nurse's assignment sheet. That weaving is another artistic performance.

SUMMARY AND CONCLUSIONS

The art of nursing is multivalued. Nursing deals with a long time span—prevention, healing, rehabilitation—for patients and families and is seldom a solo performance. Part of the art is in working together. Continuity of service through prehospitalization and posthospitalization or during illness without hospitalization is desirable and comes through longitudinal communication, using systems of referral and other means. Patient-nurse relationships are instrumentalities of therapy increasingly utilized by doctors. The art of communication is one of the key arts in nursing, communication between nurse and patient, nurse and nurse, nurse and doctor. Nursing follows medicine in its development; yesterday it began promoting patient participation in restoration; today it looks for continued medical advance in the care of the chronically ill and of the ambulatory patient. Nursing provides supporting services to medicine in clinical research, epidemiology, disease control, and health education, as well as in therapy. Nursing analyzes itself, using other experts as well as nurses in its research activities. Nursing strives to improve its own administration and to design its education to the end that the practitioners of the art may achieve the objectives of the art. The objectives are: meeting the needs of each patient comprehensively and forwarding the physician's purposes in therapy, rehabilitation, or prevention.

About that education, I would make only two comments. For the nurse who is to comprehend, interpret, and carry out physicians' directions for multivalued nursing care, for the nurse who is to set the tone of the nurse-patient relationship, for the nurse who is the key to vertical and longitudinal communications, education must be more than technical. Its bases are biological and physical sciences, social sciences, and the humanities. The heart of nursing education is the practice in hospitals, clinics, and homes into which these other learnings are integrated. That practice is organized around problems of selected patients as these are solved in the long-range plan for therapy. The other comment is this, people who are to work together can profit by learning together. I would not have this statement interpreted to mean that student nurses dissect cadavers with the medical students in the anatomy lab, but it might mean that the two share "relationship development lab" and "communications lab" and that they look together through that lens that shows the patient as a whole human being in a social setting that has a past and a future.

The art of nursing and education for that art places in the central position a concept that I would describe, again in the words of Albert Schweitzer, as Reverence for Life. Nurses practicing their multivalued art here in this building will be functional members of the great health team that makes Reverence for Life the true value of the Mayo Memorial.

Anomalous Pulmonary Veins.—Anomalous pulmonary veins are a common cause of increased pulmonary blood flow and are often associated with an atrial septal defect. They may be asymptomatic or they may cause right heart strain because of the left-to-right shunt which is proportional to the number of anomalous veins present. The diagnosis is usually made at cardiac catheterization when the catheter tip is found to pass into the lung field from the right atrium or one of its tributaries and fully oxygenated blood is withdrawn. However, this is not pathognomonic in the case of passage from the right atrium, since the catheter tip may pass into a normally inserted pulmonary vein after an unrecognized passage through an atrial septal defect. Because of increasing surgical skill this anomaly is becoming amenable to correction when this is required.—Col. R. P. Johnson (MC), U. S. Army, Anomalous Pulmonary Veins: Report of Nine Cases, *Annals of Internal Medicine*, January, 1955.

EFFECTIVE REDUCTION OF NEEDLESS HEBDOMADAL DEATHS IN HOSPITALS

A LONG-TERM PUBLIC HEALTH PROGRAM IN CHICAGO, WITH SPECIAL REFERENCE TO USE OF AN ALERTER SYSTEM

Herman N. Bundesen, M.D., Chicago

Use of Epidemiological Methods for Improving Obstetric and Early Pediatric Care

The extremely high death rate in infants, both those born prematurely and those born at full term, in the first seven days after birth in hospitals, year after year, is a grave problem for the following reasons. 1. More infants now die in the United States during the first three days of life than during the other 362 days of the first year. Ninety-five per cent of the 415,230 births in Chicago in the most recent five years, 1950-1954, occurred in hospitals, and 97% of all hebdomadal deaths (those occurring in the first week of life) in Chicago in these five years were in infants who were born in a hospital and died without ever leaving the hospital. 2. Hebdomadal deaths during the past 15 years in Chicago have constituted two-thirds of all deaths in persons under one year of age. 3. Of all the infant deaths in Chicago in 1954 52.9% occurred in infants under 7 days of age who were born in hospitals and who died without ever leaving the hospital. Thus, "The persistently high perinatal mortality rates stand foremost among urgent problems on the agenda of public health workers," [1] and it is the purpose of the Chicago program to find ways and means for preventing this great loss of lives of infants during the difficult first few days following birth in hospitals. At the moment, infants who die in association with the birth process present one of the outstanding problems in preventive medicine.

Until the present program of the Chicago Board of Health was inaugurated, the reasons for these continuing high hebdomadal death rates in hospitals and particularly the high rates of the first day and the first three days, as far as we at the board of health have been able to determine, had not been sufficiently investigated epidemiologically on the basis of meaningful clinical records. Our epidemiological investigations, made by clinicians with special training in this field, have shown that the reasons for these high hebdomadal death rates are the faulty practices associated with hospital obstetric and pediatric care.

Experience has indicated that faulty practices would not continue to occur if the hospital administrators and chiefs of the obstetric and pediatric staffs as well as the health officer knew at once exactly what was going on. However, these groups cannot find out what is going on unless the hospitals maintain complete and accurate records. Once the faulty practices have been brought to the attention of these responsible groups and they realize the true picture of the current faulty obstetric and pediatric practices in hospitals, it becomes their duty to evaluate carefully the quality of care being rendered by the hospitals and to improve it when necessary. We have found that, when the responsible hospital personnel are informed of faulty practices, they are most anxious to participate in improving their own hospital program. According to Anderson [2] this problem "should be brought to the attention of as large a segment of the public health and hospital field as possible."

Analyses of dependable mortality statistics show that during the past several decades there has been little reduction in the (hebdomadal) death rates, as well as little progress in determining the actual reasons for the continuing large number of preventable deaths in newborn infants within the period of their initial hospital care. On the other hand, the statistics do clearly show that there has been spectacular progress during the same span of time in reducing the death rate in infants from 1 week through 11 months of age because the reasons were determined for deaths in infants after the period of their initial hospital care. The tremendous saving of infant lives during this posthebdomadal period has been brought about to a great extent by the application of a number of public health techniques developed through knowledge of the reasons for these deaths, which was obtained by the standard epidemiological approach. These techniques include protection of the milk and water supplies and introduction of early immunization procedures against whooping cough, diphtheria, and measles, which not so long ago caused many deaths in infants. In addition, part of the reduction in the death rate of the posthebdomadal period is accounted for by early diagnosis of disorders of infancy by skillful family physicians and the introduction of the sulfonamide drugs and antibiotics for treatment of these disorders.

Similarly, we have now made epidemiological investigations of deaths in infants occurring during their initial period of hospital care and have found that there is a combination of reasons for a great number of these early deaths, including components related to both obstetric and early pediatric care. By using epidemiological methods, we believe that progress comparable to that in determining the reasons for posthebdomadal deaths has been made in Chicago in determining the reasons for the high hebdomadal death rate in hospitals, and we are now gradually bringing about a reduction in this death rate.

President, Chicago Board of Health.

This study was supported in part by a grant from the American Committee on Maternal Welfare.

The substance of this article will appear in more detail in a later publication as an official report.

William I. Fishbein, M.D., epidemiologist; Frank C. Bauer, A.B., biostatistician; Robert P. MacFate, Ph.D., Chief, Division of Laboratories; and Henry Spiegelblatt, M.P.A., technical advisor, aided in reviewing this report.

This study would not have been possible without the assistance and wholehearted cooperation of physicians in Chicago, who, with the hospital staffs, made available their records and case reports of infant deaths.

1. Goldmark, C. S., Jr.: Proceedings of the Special Committee on Infant Mortality of the Medical Society of the County of New York, 1951-1952.

2. Anderson, G. W.: Personal communication to the author.

NEED AND ESSENTIALS OF PROGRAM

Since the great majority of infant deaths occur in hospitals during the first week of life and over a third on the first day of life, there is an urgent need for a new type of workable, cooperative, comprehensive public health and hospital program directed toward reducing the number of these hebdomadal deaths. This program should embody public health techniques, the most important of which is a detailed epidemiological investigation of each hebdomadal death immediately after it occurs. Such epidemiological investigations are powerful and indispensable tools in delineating the nature of the problem, in finding the causes for early deaths occurring in hospitals, and in evaluating the various methods and the most effective attack that may be used to eliminate the causes for these deaths.[3] In addition, such outstanding authorities as Eastman, Guttmacher, Hellman, Taylor, and Williams have emphasized that all of the knowledge and many of the resources necessary to solve the problem are already at hand. For a program to be successful in solving this problem, however, it is necessary to make effective, continuous use of this knowledge and these resources.

To be most successful, it is imperative that such a program provide a system immediately to alert health officers and top level hospital management, especially the hospital administrators and chiefs of the obstetric and pediatric staffs, to the existence of avoidable "habit patterns" of faulty hospital practices such as the use by some of the staff of unacceptable methods in the delivery and early care of infants. Once alerted to these faulty hospital practices, health officers and top level hospital management, who have a common responsibility in the control of needless hebdomadal deaths, may immediately take corrective action.

For some time we have studied the practices and procedures used in the delivery and early care of infants in the 49 maternity hospitals licensed by the City of Chicago, with an average of 65,000 total births each year, over the past decade, and 69,820 births in 1954. These studies have pointed up the importance of detailed epidemiological investigations in the prevention of needless hebdomadal deaths—noninfectious as well as infectious —"not with the thought that the facts discovered by such investigations will in any way alter the death that has occurred, but rather that those factors will be uncovered which contribute to the deaths and which might, if uncorrected, lead to subsequent deaths of a similar character."[2] As a result of these studies, we also realize the value of the statistical approach to this problem, since "the basic data on which public health activities have been planned have come primarily from vital statistics."[4] Matching the death reports with records of birth has provided much useful information essential to the operation of this public health program, but in order to draw valid conclusions from this information, we have found it necessary to authenticate the cause of death by meaningful, dependable clinical records and satisfactory postmortem examinations.

THE NEW CHICAGO PROGRAM

Our previous program was concerned with the prevention of all neonatal deaths, many of which occur after the infant leaves the hospital. The new Chicago program, however, is built essentially around the epidemiological approach to hebdomadal deaths with preventable factors that occur in hospitals. In most cases, these hebdomadal deaths result from numerous noninfectious disorders. In addition to standard epidemiological investigations, this new type of workable public health program includes an evaluation of the quality of care given by physicians and nurses to parturient women and newborn infants in hospitals, as well as measures that will improve the quality of this care when indicated. Each hospital's service for mothers and newborn infants is carefully evaluated in the light of its death rate (based only on deaths with preventable factors) as often as is necessary to learn what faulty practices are being employed in the care of infants. When faulty care is discovered, corrective measures are instituted. The program also includes methods whereby the services of the health officer are evaluated to determine to what extent he is fulfilling his function and responsibility in contributing to the control of needless hebdomadal deaths.

In formulating a program for reducing hebdomadal deaths, clear planning is essential. As Galdston[5] so wisely stated, as early as 1937, "any program for maternal welfare [and we now emphasize infant welfare] which aims to integrate and to utilize to the full all available resources calls for *clear plans* and the *assignment of responsibilities* and the exercise of *vigilant supervision.* Unless plans are clearly formulated in detail and a special body of interested persons is devoted to their accomplishment, little will be done." Without such plans and their successful implementation, high death rates will continue just as Galdston predicted. Also essential to the success of a program for reducing hebdomadal deaths is constant, dynamic leadership in carrying out every detail of the program.

As a result of our detailed investigations of hospital procedures we soon realized, as did Wallace[6] and her co-workers, that to evaluate and then to improve existing care for mothers and newborn infants in hospitals most effectively, new criteria for such an evaluation were greatly needed at this time so that administrators, clinicians, and statisticians might be more effectively guided in future planning. As they stated, "Such criteria should be as objective, valid and reliable as possible and at the same time should measure the practical aspects of care which are most vital to the survival and well-being of mother and baby." With but few exceptions these criteria are concerned with the quality of obstetric, pediatric, and nursing care and with the policies and procedures for patient care established by hospitals.

The present program, which includes thorough epidemiological investigation of hebdomadal deaths and the evaluation of the quality of care of mothers and newborn infants in hospitals, has been in operation in Chicago for the past several years, and as our experience has in-

3. Hunt, E. P.: Getting at the Facts of Infant Losses, Children **2**: 15-21 (Jan.-Feb.) 1955.

4. James, G.; Patton, R. E., and Heslin, A. S.: Accuracy of Cause-of-Death Statements on Death Certificates, Pub. Health Rep. **70**: 39-51 (Jan.) 1955.

5. Galdston, I.: Maternal Deaths—The Ways to Prevention, New York, Commonwealth Fund, 1937, p. 87.

6. Wallace, H. M.; Gold, E. M.; Losty, M. A., and Rich, H.: Criteria for the Evaluation of the Quality of Maternity and New-Born Care, Am. J. Pub. Health **42**: 499-507 (May) 1952.

creased, the program has been constantly improved and amplified, with the splended cooperation of the hospitals. An outstanding significant new approach was made in 1954 by the institution of an all-important "alerter system," described later in this article. As indicated by Anderson from his wealth of public health experiences, this type of program "represents the first real active approach to this problem." From a detailed study of all the collected statistical material on an extensive number of hebdomadal deaths and from experience with the operation of the program, we have discovered the reasons for the continuing occurrence of so many needless hebdomadal deaths in hospitals in the face of our intensive, but often not too successful, drives to eliminate these deaths in the past. Hence, we feel that the new approach, using the alerter system, places us in an advantageous position to attack this hospital problem more effectively. From the facts revealed by the statistical material, epidemiological investigations of hebdomadal deaths, evaluation of hospital obstetric and pediatric care, and clinical and pathological studies to determine the distribution of the anatomic causes of death, we now know in just what way the number of these needless deaths may be reduced.

CAUSES OF DEATH

Unless health officials know the true causes for illness or death in newborn infants and know the numbers involved, they will have no reliable basis for measuring the results of their efforts. Moreover, to delineate the size and nature of the problem and to suggest effective approaches and areas of concentration in reducing the number of needless hebdomadal deaths, a knowledge of the distribution of the various anatomic (underlying) causes of these deaths is essential. To determine a valid distribution of the true anatomic causes of death it is necessary to perform a sufficiently large number of satisfactory postmortem examinations and obtain corresponding clinical histories. This has been done in Chicago, where for the past two decades satisfactory postmortem examinations have been done in about 80% of the approximately 1,200 hebdomadal deaths each year in hospitals. To be considered satisfactory, a postmortem examination must have (1) been done by a competent pathologist with qualifications equal to those required by the American Board of Pathology who is familiar with fetal and infant pathology, (2) included a gross examination of the entire body including the brain and cranial cavity, (3) included a microscopic examination of any tissues necessary to make an accurate diagnosis, and (4) included a complete report of the results of the examination. Whenever the postmortem record stated that microscopic examinations of all important tissues were not made, but the cause of death was obvious to the trained pathologist from the examination made, the post mortem was also considered satisfactory.

The true anatomic cause of death can, in most cases, be determined only when complete clinical histories and competently performed postmortem examinations are obtained and carefully studied. As pointed out previously,[7] the causes of hebdomadal deaths stated on the death certificates when satisfactory postmortem examinations have not been made often are erroneous and differ materially from the true anatomic causes of death found when satisfactory postmortem examinations have been made. So many of these death certificates sent to the National Office of Vital Statistics contain erroneous causes of death that there is serious doubt as to the validity of using cause of death data from these incorrect certificates as a basis for making epidemiological studies of hebdomadal deaths. There are also other factors that contribute to the inaccuracies in the cause of death data on death certificates. For example, the physician often can determine the true cause of death only on the basis of complete postmortem findings, and, as a rule, the death certificate is filled out before the postmortem findings are available. Furthermore, when these findings do become available, little effort is made in most states and municipalities to correct the death certificates.

The validity of cause of death data also is contingent upon correct coding. Errors in coding deaths occur when the causes of death on the death certificate have not been entered in proper sequence. We, therefore, realized that to be able to draw meaningful conclusions from the distribution of the true anatomic causes of death, it was not advisable to rely on the coded statistics based only on the information appearing on the death certificates, when the accuracy of the information on these certificates has not been established.

The U. S. standard death certificate calls for the causes of death to be entered in the following order: (1) the direct cause of death, (2) the underlying causes of death, and (3) additional significant conditions contributing to the death. Frequently, the entries on the death certificate are not recorded by the physician in an order necessary to show the actual sequence of events causing death even though a clinical history and postmortem findings are available. The physician should always give due thought to the conditions that actually caused the death, so that he can enter these conditions in their proper sequence on the death certificate. "Out of all of the diseases or conditions listed on the death certificate, one and only one must be selected as the underlying cause of death, and this is the one that enters into the primary tabulations published by the States and the Public Health Service."[8] For example, if a serious malformation such as congenital heart disease were entered as the underlying cause of death and pneumonia were indicated as the direct cause of death, the death would be coded as due to congenital heart disease, that is, a congenital malformation. This takes place because according to the rules of classification under the latest revision of the International List of Causes of Death, it is required for statistical purposes to code the underlying cause as the cause of death. Since little can be done during the initial stay in the hospital to combat malformations but much can now be done to prevent infections, it is apparent that correct data on the cause of death are needed to point out the areas in which most of our efforts should be concentrated. Governmental offices of vital statistics throughout the world, using the International List of Causes of Death, code all deaths similarly and publish statistics on the basis of the under-

7. Bundesen, H. N.; Fishbein, W. I.; Dahms, O. A., and Potter, E. L.: Factors Responsible for Failure Further to Reduce Infant Mortality, J. A. M. A. **109**: 337-343 (July 31) 1937.

8. Dunn, H. L.: What Is the Role of the Health Officer in Improving Cause-of-Death Statistics? Department of Health, Education, and Welfare, Public Health Service, National Office of Vital Statistics, 1953.

lying causes of infant deaths. These published data are the only information available to most researchers for study of the problem of infant deaths and may be very misleading. This does not result from any inherent fault of the International List of Causes of Death in its rules of coding but rather from the improper recording of sequence of events leading to the death as indicated by those who fill out the death certificate.

In summary, in order to arrive at the correct percentage distribution of the causes of death, it is necessary to carry out satisfactory postmortem examinations, obtain authentic clinical histories, and have well-trained physicians thoroughly and critically review all of this data. In order to obtain correct death certificates and to determine the true anatomic causes of death, we have employed the following procedures: 1. Satisfactory postmortem examinations were performed in every death possible (80%). 2. Copies of the entire postmortem protocol were obtained from the pathologists at the various hospitals. 3. A review was made of the clinical record. 4. These postmortem findings and the clinical record were compared with the information shown on the death certificate, and the death certificate was corrected, if necessary, to conform with the causes of death as shown by the postmortem examination and clinical history. 5. The causes of death were rearranged in the proper sequence as determined by a study of the clinical history if the causes of death on the death certificate were entered in the wrong sequence, even though the proper causes of death were shown. 6. These accurate, corrected certificates were then used to calculate the percentage distribution of the true anatomic causes of deaths occurring in Chicago, and the corrected certificates were sent to the state office of vital statistics.

We believe that this system of obtaining satisfactory postmortem examinations, of having copies of the protocal submitted to the health officer, of reviewing the death certificates on the basis of the clinical history, and of obtaining the causes of death in the proper sequence should be carried out by every health authority. In this way, accurate, reliable statistics on the percentage distribution of the causes of death in sufficiently large numbers will be sent to the National Office of Vital Statistics, and it is only from this source that official national statistics can be obtained. On the basis of these accurate, reliable statistics, the direction in which epidemiological procedures should be exerted can be determined. Dunn [8] has indicated that improvement of cause of death statistics is a problem for the health officer.

We have included a systematic study of pathological and clinical findings in hebdomadal deaths, combined with inspections of maternity services in hospitals (continuing in Chicago for a number of years [9]) as an essential part of the Chicago program for reducing hebdomadal deaths. The percentage distribution of the true anatomic causes of deaths revealed by our pathological studies and clinical investigations from 1936 to 1954 is presented in table 1 and figure 4. We have made every effort to determine to what extent faulty practices in the hospitals have contributed to the various anatomic causes of death and in many instances have been able to demonstrate a causal relationship. The great majority of deaths occurring in infants under 7 days of age in hospitals (60.5% from 1951 to 1954) as shown by our pathological studies were due to abnormal pulmonary ventilation (respiratory distress). There are many faulty practices that may contribute to deaths from abnormal pulmonary ventilation, such as failure to keep the infant's air passages clear, the use of analgesics and general anesthetics in the delivery of premature infants, and failure to employ proper methods of resuscitation. When the actual causes of death are known, and the faulty practices contributing to such deaths also are known, we are in a better position in many cases to exert the necessary well-established corrective efforts to eliminate the faulty practices that contribute to deaths from these causes.

FAULTY POLICIES, PRACTICES, AND PROCEDURES

Investigations and surveys conducted by our specially trained obstetricians and pediatricians with American board status have revealed preventable factors in a number of hebdomadal deaths in Chicago hospitals. We therefore have made a careful study of the available medical literature to determine whether similar factors had been found in hospitals in other large communities. It was found that many such preventable factors in hebdomadal deaths had already been evaluated and reported by the Committee on Public Health Relations [10] of the New York Academy of Medicine. In conjunction with the staff of the New York department of health, starting in 1948, they also made surveys and held conferences with hospital personnel. Among the more salient faulty practices and deficiencies in maternity divisions of hospitals stressed by the New York Academy in its study and report in 1952 are the following:

TABLE 1.—*Percentage Distribution of True Anatomic Causes of All Hebdomadal Deaths as Determined by Satisfactory Postmortem Examinations*

True Anatomic * Causes of Death	Deaths in Infants Under Age 7 Days, 1951-1954	Deaths in Infants Under Age 7 Days, 1953-1954	Deaths in Infants Under Age 1 Day, 1951-1954	Deaths in Infants Under Age 28 Days, 1936-1949
Abnormal pulmonary ventilation (respiratory distress)	60.5	62.3	67.4	43.7
Malformations	12.1	11.7	11.2	16.6
Injuries at birth	9.7	7.8	9.3	15.8
Infections	6.8	7.5	3.0	13.4
Blood dyscrasias	4.9	4.5	3.3	5.3
Erythroblastosis fetalis	4.2	3.8	2.9	2.8
Hemorrhagic disease of newborn infant	0.7	0.7	0.4	2.4
Anoxia	5.0	5.2	5.1	3.8
Miscellaneous causes	1.0	1.0	0.7	1.4

* Potter classification.

> A number of maternity services were found so wanting in necessary equipment and so faulty in their practices that they constitute a hazard to the parturient women and their babies. Among these deficiencies is the keeping of records.
>
> A considerable number of maternity services in this city [New York] do not meet minimum requirements for adequate care and have not formulated and implemented desirable consultation policies. . . .
>
> . . . Particularly inadequate is the extent of pediatric supervision in the nursery. Some of the obstetric services are functioning without the active supervision of qualified obstetricians.

9. Bundesen, H. N., and others: Progress in the Prevention of Needless Neonatal Deaths, Annual Report, Chicago Board of Health, 1952.

10. New York Academy of Medicine, Committee on Public Health Relations: Infant and Maternal Care in New York City: A Study of Hospital Facilities, New York, Columbia University Press, 1952.

Competent supervision of medical services within the hospital, closer association of pediatric with obstetric work, and strict adherence to sound rules and regulations are of the utmost moment.

This serious situation is not peculiar to New York alone. Our epidemiological investigations and hospital inspections, started in 1950 and conducted in cooperation with the hospitals, have revealed that the most frequent deficiences and faulty practices contributing to hebdomadal deaths in certain Chicago hospitals were as follows:

Entrusting insufficiently trained and unlicensed internes and residents with complicated deliveries without supervision, especially in ward cases. . . . Unindicated induction of labor by stripping membranes and administration of oxytocics. . . . Administration of excessive amounts of sedatives. . . . Improper treatment of threatened abortions. . . . Failure to have early consultation as required by the rules and regulations when complications of labor develop and when there are evidences of fetal distress, such as meconium discharge and increased rate of heart tones.

Improper Management of Delivery. Failure to perform an episiotomy when indicated. . . . Failure properly to evaluate the size of the infant in repeat cesarean sections, resulting in many such infants being delivered prematurely. . . . Administration of large quantities of general anesthetics in cesarean section when not indicated. . . . Performance of cesarean section without adequate and proper indications and failure to carry out proper gastric lavage on the infant when indicated. . . . Excessive use of general inhalation anesthetics and analgesics at the expense of the life of premature infants particularly the smaller ones. . . .

Improper Pediatric Care. Failure promptly to use proper methods of resuscitation in delivery room. . . . Failure to provide immediate, adequate care for all infants in the nursery. . . . Failure to perform an immediate Coombs' test on an infant born of an Rh negative mother and to have a skillful team and necessary facilities available at all times for performing transfusions. . . . Failure to make bilirubin determinations immediately on an infant born of an Rh negative mother. . . . Failure to perform a replacement transfusion immediately on an infant showing symptoms or signs of erythroblastosis. . . . Failure to have sick infants seen and carefully examined early by the attending physician and a pediatric consultant when required. . . . Inadequate pediatric follow-up in the nursery of sick infants. . . . Leaving the care of the sick infant to insufficiently trained, unlicensed residents and internes.

Failure to put the newborn premature infant immediately into a pre-warmed incubator and to provide immediate and proper transportation of the premature infant from the delivery room to the premature nursery. . . . Failure to observe the premature infant continuously in the nursery and failure to render proper care, leaving the care of premature infants to insufficiently trained residents and internes and nurses. . . . Failure to provide a specially-trained team of obstetricians, pediatricians and nurses and an expert in resuscitation to care for the premature infant, from the moment of birth. . . . Failure to have immediate pediatric consultation for all infants weighing less than 4½ pounds when necessary, as required by regulation. . . . Failure to keep air passages clear at all times.

Essentially, faulty practices are all included in failure to provide what is currently accepted as the highest quality of obstetric and pediatric care in hospitals for all mothers and all infants at all times, and failure to realize fully that "the desirable attendant for the pregnant woman is a physician adequately trained and experienced in obstetrics and so aware of his limitations that, when emergencies arise which are beyond his competence, he will not delay in securing help."[11] This is especially true in the case of the smaller premature infant. According to Wallace,[12] "It is well accepted that women who are in premature labor should receive no *analgesia* in order to protect the respiratory mechanism of the fetus. Certainly *morphine* is usually considered to be the *most depressant* of all analgesic agents. . . . It is strongly recommended by most obstetricians that episiotomy be used at the time of delivery; low forceps is almost as widely accepted as a necessary procedure."

Faulty Medical Records.—Grossly inadequate, illegible, erroneous, and misleading obstetric and pediatric hospital records with much pertinent information lacking (including postmortem records and prenatal records) have been found in many Chicago hospitals, particularly those with high death rates. Poor records, inaccurate to a great degree, make it most difficult, if not almost impossible, for the hospital administrator, the chiefs of the obstetric and pediatric staffs, as well as the staff of the board of health to determine and evaluate the exact practices and procedures used and the types of patient care rendered in maternity divisions. Such poor records make it most difficult to determine whether proper care is being administered. The importance of accurate records was recently noted in a study sponsored by the Committee on Public Health Relations of the New York Academy of Medicine.[10] A noteworthy feature of this study "was the high correlation revealed between the adequacy of records on the one hand and the adequacy of environment and satisfactory administrative procedure on the other. In other words, the medical records department was found to be a sensitive index of conditions within a hospital."

Too often there is a failure on the part of the chiefs of the obstetric and pediatric staffs to study, review, and evaluate the records immediately after the deaths occur (if at all) either alone or with those concerned with the delivery of mothers and after-care of their newborn infants. Such reviews are necessary to bring to light factors, if any, that may have contributed to these infant deaths so that corrective measures may be instituted. Hospitals that have needless deaths month after month and year after year, as a rule, also have incomplete, misleading, inaccurate, and vague records. As the interest in epidemiological investigations has increased, there has been a marked effect in raising the standard of clinical recording in hospitals to a very high level.

ELIMINATION OF FAULTY PRACTICES

It is obvious that, in order to reduce the needlessly high death rate, the existence of all faulty practices in hospitals must be eliminated.

Role of the Hospital.—One cannot escape the fact that needless deaths due to poor quality of obstetric and pediatric care would not continue to occur if top level hospital management, including the hospital administrator and the chiefs of the obstetric and pediatric staffs, were immediately made aware that there were serious breakdowns in their institutions. If preventable factors in hebdomadal deaths are discovered by a review of the records or in other ways, the reason for their occurrence

11. Galdston,[5] p. 32.

12. Wallace, H. M.; Rascoff, H., and Knobloch, H.: Pilot Study of Maternal and Neonatal Factors in Premature Infant Mortality, J. A. M. A. **146**: 886-891 (July 7) 1951.

should be determined. Thereafter, the chiefs of obstetrics and/or pediatrics should immediately take the appropriate steps to prevent the further occurrence of such preventable factors that might lead to future deaths.

These steps include the following measures.

(*a*) Insisting on complete compliance with the regulations for maternity hospitals promulgated by medical societies and officially adopted.

(*b*) Insisting that all procedures be in accordance with accepted practices particularly in the delivery and care of premature infants.

(*c*) Assuring that all premature infants immediately and constantly receive expert pediatric and nursing care and that all facilities are provided and used in the hospital for properly caring for these infants, particularly during the critical early hours. The percentage of premature infants weighing under 1,000 gm. that now survive is extremely small, regardless of the quality of care administered. Most of the premature infants weighing more than 2,000 gm. survive even with suboptimal care. There is need, therefore, for increased concentration of effort on the vulnerable group of premature infants weighing from 1,000 to 1,999 gm., many of whom can be saved with proper care. This is the area in which the maximum results can be achieved (fig. 5).

(*d*) Discussing with the hospital administrator the advisability of eliminating from the staff physicians who are habitual offenders in violating valid rules and regulations leading to needless deaths and who cannot be persuaded to follow sound regulations.

(*e*) Making sure that all the attendants who assume the responsibility for complicated deliveries and care of sick or premature infants have the necessary experience and training.

(*f*) Making sure that physicians without sufficient specialist training call a qualified consultant for every complicated case of labor and delivery and that the consultant responds immediately, both of which are required by the regulations. In addition, no major operative procedure should be performed until a consultant or physician with qualifications of a consultant has seen the patient and approved the procedure. Unless the chief of staff is confident of the ability of the attending physician, a consultant should carry out the operative procedure or assist in and be responsible for its performance.

(*g*) Making sure that the hospital establishes its own rules and regulations for acceptable policies, practices, procedures, and facilities, particularly the indications for which consultation is required, in accordance with accepted regulations of qualified agencies—municipal, state, and professional—and seeing to it that all members of their obstetric and pediatric staffs are aware of and follow these regulations. There is a general tendency in some hospitals to violate the regulations in the care of ward patients of low socioeconomic status. Our records would indicate that this is one of the important reasons why the death rate among infants born of ward patients is so much higher than the death rate among infants of private patients.

(*h*) Insisting that attending physicians, particularly those assigned to the ward service, are called to the hospital when urgently needed and respond without delay as required by regulation.

(*i*) Assuring that the supervising nurse of the maternity division aids in improving the quality of maternal and infant care by making sure that all the facilities needed to provide adequate care are immediately available for the physicians' use, that enough well-trained nurses are provided during the entire 24 hours of every day, that she calls attention when necessary to the rules and regulations of the board of health, and that proper policies and procedures established by hospital regulations are followed to the letter. Obviously, to fulfill these important functions, the supervising nurse must be well-trained, forceful, and willing to assume responsibility.

(*j*) Insisting that a trained physician-anesthesiologist be available at all times to assure that regulations are followed in the administration of anesthetics to parturient women.

(*k*) Insisting that there be someone present in the delivery room skilled in proper resuscitation of the newborn infant and particularly to provide care for the infants during the first few minutes since the first fifteen minutes are the most important of the whole life span. "Obstetric, pediatric, and anesthesiology authorities are becoming increasingly aware of the importance of resuscitation as a lifesaving measure in the delivery when spontaneous respiration is delayed."[13]

(*l*) Requiring that the records of the delivery and pediatric care of every infant contain all available information and that information concerning all events be reliable, complete, and accurately entered on the record as soon as these events occur; that records be available at all times; that each record be carefully reviewed when a death occurs; and that the factors connected with the death be thoroughly investigated. Accurate, complete entries are necessary to establish the reasons for a death, how it occurred, when it occurred, and the conditions under which it occurred.

The Joint Commission on Accreditation of Hospitals has established rules that, if followed, will lead to more accurate and complete records. This commission in its Standards for Hospital Accreditation[14] has made "preparation of adequate medical records" a part of the duties and responsibilities of the medical staff. It has placed on the governing body of a hospital the responsibility of providing "trained personnel for a medical records department." It has required that a medical records committee be appointed to "supervise and appraise medical records and shall assure their maintenance at the required standard. The Committee shall meet *at least once a month* and submit to the Executive Committee a report in writing which will be made a part of the permanent record." The hospital administrator should be notified of repeated breakdowns in record-keeping. Every record should be properly and promptly checked by some competent designated person in the hospital to be certain that all of the records meet the requirements of the statutes, ordinances, and rules and regulations of the hospital and board of health.

Role of the Board of Health.—Since the staff of the Chicago Board of Health has readily available the up-to-date data concerning all infant births and deaths, including epidemiological investigations, it is in a position to prepare statistics to show the hebdomadal death rates based on the total of all deaths as well as only on deaths with preventable factors for each month or for lesser periods for all of the maternity hospitals. These rates, which can quickly be subjected to analysis and study, can be graphically shown on an alerter system such as we have established, so that the rates of the hospitals can easily and rapidly be compared. What is even more important is that individual deaths with preventable factors in each hospital be discovered immediately after they occur, by making a day by day check, and the necessary corrective action instituted to keep further deaths with these same preventable factors from occurring. Hospitals with a record of faulty practices particularly must be kept under the constant surveillance of the staff of the board of health in this regard. Deaths with preventable factors are those deaths in which some medical or nursing error

13. Prevention and Treatment of Asphyxia of the Newborn, by the Child Health and Welfare Committee, Maternal Welfare Committee and the Committee on Anesthetic Study, Bull. Kings County M. Soc. **28**: 179 (May 1) 1949.

14. Standards for Hospital Accreditation, Joint Commission on Accreditation of Hospitals, Chicago, 1953.

in technique or procedure or judgment occurred in the delivery or care of the infant or where facilities were deficient for providing proper medical or nursing care. Whether or not there are such errors is better determined by specially trained obstetricians and pediatricians with American board status.

We have found that an excellent way to secure prompt action where faulty practices are used is for the staff of the board of health to meet with the hospital administrator, chiefs of the obstetric and pediatric staffs, nursing supervisors of the maternity division and newborn nursery, and the record librarian, since all of these various persons are desirous of knowing the facts. At such a meeting in the offices of the board of health all of the facts relative to needless deaths and the actual situation in the hospital can be freely and frankly discussed and the most effective measures for correcting deficiencies determined and put into action. Thus the quality of work of the entire professional staff in the hospital can be raised to the highest standard. However, it has been noted that repeated conferences may be needed in some cases to keep the hospital up to standard.

We have found that when the alerter system is fully in operation the obligation of the board of health to inform hospitals of their deficiencies and to have faulty conditions corrected can be carried out completely, effectively, and with dispatch. The alerter system also aids in measuring the efficiency of our program for reducing hebdomadal deaths. It must be emphasized, however, that the efficiency of any system is no better than the personnel who operate it. Most important, the staff operating the alerter system must have the will to execute the job and the health officer must inspire his staff. Only with wholehearted enthusiasm can a program be continuously maintained at maximum efficiency.

The Alerter System

The alerter system is a completely new concept in approaching the problem of improving care of mothers and newborn infants in hospitals. By means of this system, the staff of the board of health, working closely with hospital administrators, nurses, and physicians—especially obstetricians and pediatricians—immediately calls the occurrence of hebdomadal deaths with preventable factors to the attention of all of the individuals concerned. This system makes it possible to demonstrate the degree of effectiveness of our program at any and at all times. It does this by graphically showing the monthly and cumulative hebdomadal death rates of each hospital. Attention is called to possible breakdowns by high hebdomadal death rates. What is more important, this system also vividly points out day by day the hospitals in which deaths with preventable factors have occurred and continue to occur. In addition, it also constantly keeps the staff of the board of health alerted to the need for immediate corrective action, so that the hospitals involved may be promptly notified. It further shows when such corrective action has been taken. Finally, when certain staff members of hospitals relapse into a pattern of faulty practices in the care of parturient women and their infants (as certain of them do), contributing to needless hebdomadal deaths, these relapses are detected immediately.

The hospital administrators and chiefs of staff are then realerted immediately by the board of health and fully impressed with the fact that a breakdown has occurred, if they do not already know about it (and they should know if they are promptly receiving and reviewing their own records of all hebdomadal deaths with the members of the medical staff involved). It is the duty of the hospital administrator to institute stronger measures if necessary to assure strict adherence to the regulations and operation of the maternity division in accordance with accepted practices and procedures, so that the hospital maternity division may continue to function.

The efforts of a number of the executive, professional, and technical personnel of the staff of the Chicago Board of Health are now directed toward the prevention of needless hebdomadal deaths in hospitals through operation of our alerter system. But it takes earnest, thoughtful, constant, and cooperative effort on the part of these men and women on the board of health team, and they are constantly being indoctrinated with the conviction that what they do is of the utmost importance in converting the component procedures of the alerter system into immediate sound, dynamic activity that will bring worth-while results in saving babies' lives. When this system is in full operation, every death with preventable factors will be discovered immediately by means of epidemiological investigations, and prompt action can be taken by the board of health staff concerned with the immediate operation of the system, in cooperation with the hospital authorities, to see that corrective measures are taken expeditiously and that faulty practices do not recur. By ordinance the health officer is required to take such action if steps are not promptly taken by the hospital to correct faulty practices. Standard epidemiological investigations of hebdomadal deaths are necessary for the proper functioning of the alerter system.

EPIDEMIOLOGICAL INVESTIGATION OF HEBDOMADAL DEATHS

To determine the rates for deaths with preventable factors it is necessary to make a careful epidemiological study of every hebdomadal death to discover which ones have preventable factors, as well as to ascertain the specific faulty practices contributing to the deaths. Early in 1953, as a part of these epidemiological investigations we made copies of the records on hebdomadal deaths of those hospitals with the highest hebdomadal death rates. These records were abstracted carefully by well-trained staff physicians and carefully checked and reviewed by specialists in obstetrics and pediatrics with American board status who were acting as consultants to the board of health to determine whether or not faulty practices might have contributed to these deaths.

The alerter system shows the hebdomadal death rate each month in each hospital for deaths with preventable factors as revealed by epidemiological investigations of all hebdomadal deaths. To carry out these investigations copies of the hospital records are made as heretofore. Then these records are abstracted by physicians, and they are finally thoroughly evaluated by pediatricians and obstetricians with American board status and with wide experience in clinical practice. In addition, pediatricians and obstetricians with special knowledge of hospital pro-

cedure go to those hospitals where the death rate recently has been high and make a detailed epidemiological study of all the pertinent factors connected with a specific death, as well as an evaluation of the quality of care customarily rendered in the delivery of mothers and care of their infants in that hospital. If necessary, they discuss the case with the responsible physician and with the hospital superintendent and chiefs of the obstetric and pediatric staffs. In this way, not only do they discover faulty practices connected with the specific death under investigation if any are present but also those faulty practices that may have been employed in other instances.

When all the data have been assembled, the reports are evaluated by the pediatricians and obstetricians with American board status as well as by the epidemiologist and the health officer. In the final reviews by board of

Name of Hospital	Name of Infant	Date of Death	Date Sent
(1)	(2)	(3)	(4)

B. of H. Findings	Suspected Preventable Factors	Hospital Findings	Hospital Comments
	OBSTETRICS:		
☐	Use of sedation in premature delivery	☐	
☐	Use of anesthesia in premature delivery	☐	
☐	No episiotomy when indicated	☐	
☐	Failure to evaluate size of infant in repeat cesarean section	☐	
☐	Use of general anesthesia in cesarean section	☐	
☐	Failure to perform gastric lavage and tracheal aspiration after cesarean section	☐	
☐	Improper management of toxemia of pregnancy	☐	
☐	Improper management of hemorrhage	☐	
☐	Failure to use immediately accepted measures to establish respiration	☐	
☐	Performance of operative procedures without a qualified consultant	☐	
☐	Inadequate prenatal work-up on Rh negative mothers	☐	
☐	Inadequate prenatal record or physical examination on admission	☐	
☐	Improper management of medical complications	☐	
☐	Questionable obstetrics	☐	
☐	Other	☐	
	PEDIATRICS:		
☐	Inadequate work-up and treatment of infant born of Rh negative mother	☐	
☐	Delay in carrying out necessary diagnostic tests, such as Coomb s test and bilirubin determinations in infants born of Rh negative mothers	☐	
☐	Delay in treatment of Rh infants	☐	
☐	Improper resuscitation of infant in newborn nursery	☐	
☐	Delay in transferring infant from delivery room to nursery	☐	
☐	Improper method of transferring premature or sick infant from delivery room to nursery	☐	
☐	Delayed or no pediatric consultation for sick or small premature infant	☐	
☐	Inadequate pediatric medical care	☐	
☐	Inadequate nursing care	☐	
☐	Other	☐	

PLEASE INDICATE ON REVERSE SIDE SPECIFIC CORRECTIVE ACTION TAKEN IF ANY IS REQUIRED

FIG. 1-NOTIFICATION OF DEATH SUSPECTED OF HAVING PREVENTABLE FACTORS.

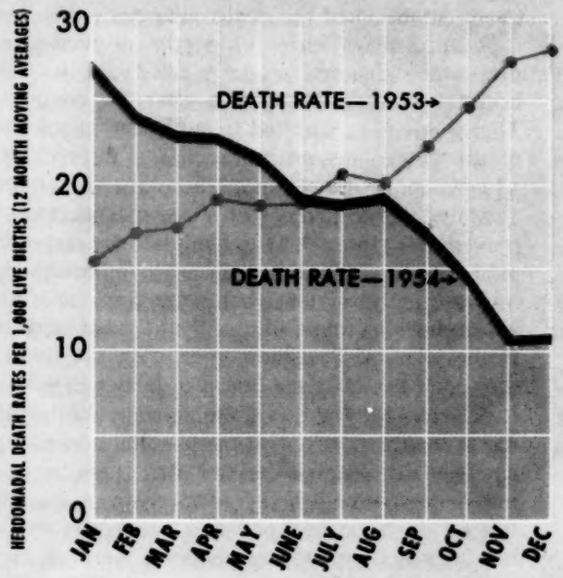
health specialists in obstetrics and pediatrics, deviations from accepted standard practices are designated as preventable factors. The most common of these preventable factors are shown in the notification form (fig. 1). When the number of deaths with preventable factors has been determined for each month it is then possible to calculate the death rate for deaths with preventable factors for entry on the proper component of the alerter system. The data concerning the deaths are kept in a file so that information relative to any one hospital's practices and procedures is readily available. A number of the deaths also is reviewed by a subcommittee of the Joint Maternal Welfare Committee of Cook County, an organization representing the Chicago Medical Society, the Chicago Pediatric Society, the Chicago Gynecological Society, the Chicago Hospital Council, the American College of Surgeons, and others. The deaths in which especially flagrant violations of the regulations occurred are called to the attention of the health officer by this committee.

A notification form for deaths suspected of having preventable factors, properly filled out, is sent to the hospital as soon as possible after the death occurred. The hospital is requested to study and check the record of the case. This procedure has a threefold purpose: (1) to make the hospital administrator immediately aware of the occurrence of a death suspected of having preventable factors, (2) to stimulate the responsible hospital personnel to study such deaths immediately and to take corrective action when necessary, and (3) to provide a check on the validity of the board of health findings. If the hospital does not agree with the findings, it is requested to notify the board of health in what respects it disagrees. If there is disagreement, the health officer discusses the matter with the hospital administrator and chiefs of the obstetric and pediatric staffs to reach a mutual understanding. To avoid antagonism, the thoroughly trained obstetric and pediatric specialists who conduct the investigations at the hospitals were chosen on the basis of their "skill, knowledge and diplomacy." However, most physicians have been very sympathetic to the purpose of these investigations, and now we seldom encounter anything but the utmost cooperation in bringing to light factors that contributed to hebdomadal deaths.

In those instances in which a hospital's death rate is excessively high or where deaths with the same preventable factors occur, the hospital superintendent and chiefs of the obstetric and pediatric staffs are invited to the board of health for a discussion of the matter with the president and executive staff of the board of health. Many such conferences have been held, and a technique has been established for handling these interviews with diplomacy and tact. Rarely have such interviews resulted in any feelings of ill will, and practically always these top level persons of the hospital have expressed their appreciation to the board of health for calling such important matters to their attention.

COMPONENT PARTS OF THE ALERTER SYSTEM

The alerter system at present in successful operation and exhibited in the offices of the Chicago Board of Health consists of a series of five main units: (1) master control panel (line graphs of hebdomadal death rates and percentage of premature births), (2) known needless death panel, (3) "premature" panel no. 1, (4) "premature" panel no. 2, and (5) individual hospital alerter panels. On the master control panel and on the known needless death panel various flashing signal lights, cardboard inserts, explanatory cards, colored tacks, colored wooden strips, and other insignia are employed. On the two "premature" panels, cardboard inserts, explanatory cards, colored tacks, colored wooden strips, and other insignia as on the master control panel are also employed. All of these units are so arranged that they quickly show the daily, monthly, and yearly number of deaths with preventable factors that occur in each hospital and the death rates by hospital of birth based (1) only on deaths with preventable factors (in infants under 7 days of age) and (2) on the total of all deaths (in infants under 7 days of age).



In order to show the trend (see Figure 2) of the hebdomadal death rate, the rates were calculated on the basis of a 12-month moving average.

The green line shows the 12-month moving average for each month of 1953, and this line has a steadily upward trend, indicating steadily worsening conditions in this hospital during 1953.

The red line shows the 12-month moving average for each month of 1954, and this line has a steadily downward trend, indicating a steady improvement.

The downward trend was brought about by epidemiological investigations of the deaths which were occurring and by the correction of the faulty practices revealed by these epidemiological investigations.

FIG. 2 - CUMULATIVE MONTHLY HEBDOMADAL DEATH RATES FOR 1953 AND 1954 FOR A SELECTED HOSPITAL, CALCULATED ON A 12 MONTH MOVING AVERAGE.

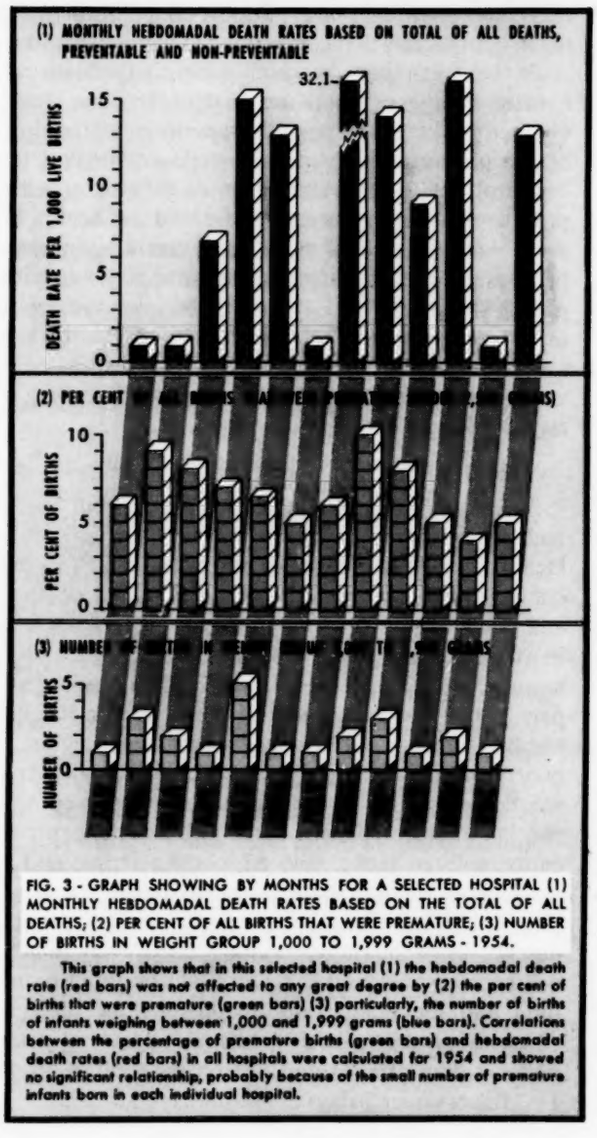


FIG. 3 - GRAPH SHOWING BY MONTHS FOR A SELECTED HOSPITAL (1) MONTHLY HEBDOMADAL DEATH RATES BASED ON THE TOTAL OF ALL DEATHS; (2) PER CENT OF ALL BIRTHS THAT WERE PREMATURE; (3) NUMBER OF BIRTHS IN WEIGHT GROUP 1,000 TO 1,999 GRAMS - 1954.

This graph shows that in this selected hospital (1) the hebdomadal death rate (red bars) was not affected to any great degree by (2) the per cent of births that were premature (green bars) (3) particularly, the number of births of infants weighing between 1,000 and 1,999 grams (blue bars). Correlations between the percentage of premature births (green bars) and hebdomadal death rates (red bars) in all hospitals were calculated for 1954 and showed no significant relationship, probably because of the small number of premature infants born in each individual hospital.

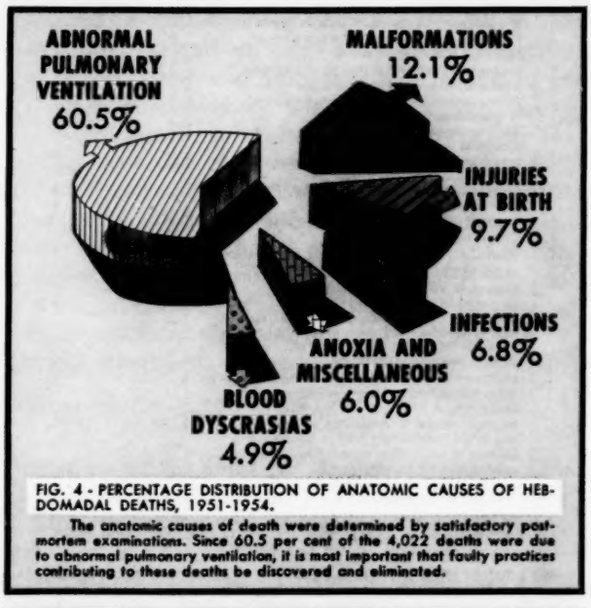


FIG. 4 - PERCENTAGE DISTRIBUTION OF ANATOMIC CAUSES OF HEBDOMADAL DEATHS, 1951-1954.

The anatomic causes of death were determined by satisfactory post-mortem examinations. Since 60.5 per cent of the 4,022 deaths were due to abnormal pulmonary ventilation, it is most important that faulty practices contributing to these deaths be discovered and eliminated.

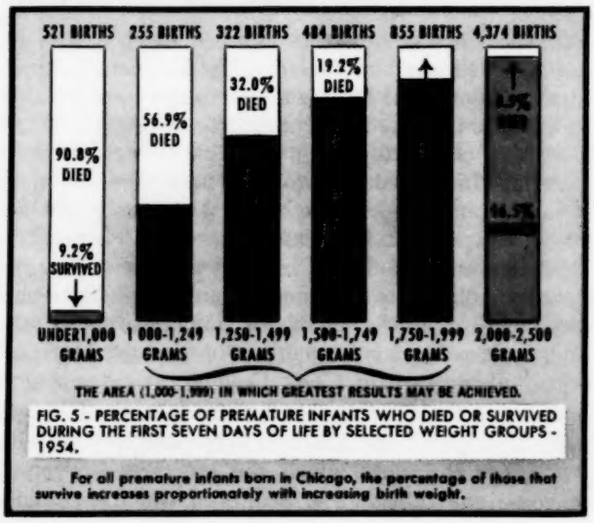


FIG. 5 - PERCENTAGE OF PREMATURE INFANTS WHO DIED OR SURVIVED DURING THE FIRST SEVEN DAYS OF LIFE BY SELECTED WEIGHT GROUPS - 1954.

For all premature infants born in Chicago, the percentage of those that survive increases proportionately with increasing birth weight.

DEATH RATES BASED ON TOTAL OF ALL DEATHS PREVENTABLE AND NON-PREVENTABLE (Under 7 Days of Age).

Group 1, Red, High Rates of 18.0 and Over

Group 2, Green, Medium Rates of 10.0 - 17.9

Group 3, Gold, Low Rates of 0.0 - 9.9

DEATH RATES BASED ONLY ON DEATHS WITH PREVENTABLE FACTORS (Under 7 Days of Age).

Group 1, Black, High Rates of 10.0 and Over

Group 2, Blue, Medium Rates of 5.0 - 9.9

Group 3, Grey, Low Rates of 0.0 - 4.9

FIG. 6 - SIGNIFICANCE OF COLORS ON THE MONTHLY HEBDOMADAL DEATH RATE CARDS, WOODEN STRIPS, TACKS, AND ALPHABETICAL LISTING.

Various colors are employed in the Alerter System so that those hospitals with high, medium and low death rates can quickly and easily be noted.

RED, GREEN AND GOLD TACKS INDICATING RANK ORDERS OF HOSPITAL DEATH RATES BASED ON THE TOTAL OF ALL DEATHS PREVENTABLE AND NON-PREVENTABLE (Under 7 Days of Age).

Round Tacks Indicate Rank Orders of Death Rates for the Latest Month for Which Death Rates Are Available.

Square Tacks Indicate Rank Orders of Cumulative Death Rates for the Present Year To-Date.

Triangular Tacks Indicate Rank Orders of Death Rates for the Entire Previous Year.

BLACK, BLUE AND GREY TACKS INDICATING RANK ORDERS OF HOSPITAL DEATH RATES BASED ONLY ON DEATHS WITH PREVENTABLE FACTORS (Under 7 Days of Age).

Round Tacks Indicate Rank Orders of Death Rates for the Latest Month for Which Death Rates Are Available.

Square Tacks Indicate Rank Orders of Cumulative Death Rates for the Present Year To-Date.

Triangular Tacks Indicate Rank Orders of Death Rates for the Entire Previous Year.

FIG. 7 - SIGNIFICANCE OF TACKS.

The tacks are used to indicate the rank orders of hospital death rates. The numbers on the tacks show these rank orders.

LINE 1 HOSPITAL HEBDOMADAL DEATH RATES (UNDER 7 DAYS OF AGE) 1953-1954 BY HOSPITAL OF BIRTH, PER 1000 LIVE BIRTHS

TOTAL BIRTHS FOR 1953—1,617

LINE 2 NAME OF HOSPITAL **062**

SECTION 1

LINE 3 { RATES OR NO. BASED ONLY ON DEATHS WITH PREVENTABLE FACTORS	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC
LINE 4 1954 RATE EACH MONTH	0	0	0			0	25.6	0	0	0	0	
LINE 5 1954 CUMULATIVE RATE	0	0	0	2.0	3.1	2.6				4.6	4.1	4.3
LINE 6 1954 NUMBER OF DEATHS EACH MONTH	0	0	0	1	1	0	4	0	0	0	0	1

Section 1 shows the monthly and cumulative hebdomadal death rates based only on deaths with preventable factors for the year 1954. It also shows the number of such deaths each month.

SECTION 2

LINE 7 { RATES BASED ON TOTAL OF ALL DEATHS (UNDER 7 DAYS OF AGE)	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC
LINE 8 1954 RATE EACH MONTH	0	0	8.4			0			8.0		0	
LINE 9 1954 CUMULATIVE RATE	0	0	2.7	6.0	7.8	6.5						
LINE 10 1953 RATE EACH MONTH								7.5				
LINE 11 1953 CUMULATIVE RATE												

Section 2 shows the monthly and cumulative hebdomadal death rates based on the total of all deaths for the years 1953 and 1954.

FIG. 8 - MONTHLY HEBDOMADAL DEATH RATE CARD FOR EACH HOSPITAL.

The significance of the colors used in the small squares is explained in Figure 6.

Master Control Panel.—Among the most important purposes of the master control panel, which is the most informative in the alerter system, are: (1) to inform the public health officer and his staff immediately of any infant deaths known or suspected to have major preventable factors; (2) to alert the staff of the board of health, which in turn alerts the staffs of hospitals, to the need for cooperative action to prevent future deviations from accepted obstetric and pediatric practices; and (3) to inform the staff of the board of health as to the time that has elapsed from the date the hospital was notified that an hebdomadal death with preventable factors had occurred to the date when the staff of the board of health is assured that proper corrective action has been taken and maintained. The units making up the master control panel include monthly hebdomadal death rate cards, small colored wooden strips, flashing red signal lights, date tags, flashing blue signal light, flashing gold signal light, large tacks, monthly date card, alphabetical listing of hospitals, and stop and go light.

Monthly Hebdomadal Death Rate Cards: The monthly hebdomadal death rate cards (fig. 8) are movable cardboard inserts visibly and graphically calling attention to monthly and cumulative hebdomadal death rates for the previous year and the current year to date, and the number of deaths with preventable factors, for the various maternity hospitals in Chicago. These data are all based on deaths of infants who were born in Chicago maternity hospitals regardless of where they died during the first seven days of life. A maternity hospital is defined here as an institution devoted entirely to the delivery of mothers and the care of their infants, or a hospital with a division devoted to the delivery of mothers and the care of their infants. Section 1 of the card is used for recording hebdomadal death rates based only on deaths with preventable factors, as well as the number of such deaths. Section 2 of the card is used for recording hebdomadal death rates based on the total of all deaths. Throughout the description of the alerter system whenever the terms "deaths" or "death rates" are used they refer only to deaths in infants under 7 days of age, unless otherwise specified. Whenever the term "total of all deaths" is used the deaths included are those hebdomadal deaths that have either preventable or nonpreventable factors or both, all added together and used as one easily obtained total.

The monthly hebdomadal death rate cards are placed on the master control panel between small wooden strips colored red, green, or gold. The hebdomadal death rate based on the total of all deaths (with both preventable and/or nonpreventable factors) for the latest month for which data are available determines the position or rank order of each hospital's card on the panel. The hospital with the highest or worst rate has the first or top position, and the hospital with the lowest or best rate has the bottom position on the panel. By rank order of a hospital's death rate is meant the order of the hospital's death rate in relationship to the death rate of all other hospitals in Chicago. For example, the hospital with the highest or worst death rate would have rank order 1 and the hospital with the lowest or best death rate would have rank order 49.

In addition, the hospitals are divided into three groups. Those with the highest death rates are in group 1 and are placed between red wooden strips. Those with medium rates are in group 2 and are placed between green wooden strips. Those with the lowest rates are in group 3 and are placed between gold wooden strips (fig. 6). The position or rank order of any hospital's monthly hebdomadal death rate card usually changes every month, depending upon the relationship of its death rate to those of the other 48 Chicago maternity hospitals.

The colors black, blue, or gray are used in the small squares in section 1, to distinguish the death rates in this section, which are based only on hebdomadal deaths with preventable factors, from those death rates in section 2, where the small squares are colored red, green, or gold, which rates are based on the total of all hebdomadal deaths. The squares in line 6, section 1, are not colored, since they show only the number of deaths, not death rates.

When the hebdomadal death rates based on the total of all deaths for 1953, of each of the 49 Chicago maternity hospitals, were first listed and studied, it was found that the death rates for the various hospitals were distributed roughly into three groups: high, medium and low. These groups were: 1. The high group, containing about one-third of the hospitals. These hospitals had high hebdomadal death rates of 18.0 and over, a total of 18.0 deaths per 1,000 live births. 2. The medium group, which contained about one-third of the hospitals. These hospitals had medium hebdomadal death rates from 10.0 to 17.9. 3. The low group, which also contained about one-third of the hospitals. These hospitals had low hebdomadal death rates, from zero to 9.9.

When the hospitals were arranged in these groups and the death rates for 1953 were analyzed, and our knowledge and available evidence increased, the following pertinent facts concerning the deaths in each of these three selected groups of hospitals were revealed. In group 1 hospitals, in which the hebdomadal death rates, based on the total of all deaths were high (18.0 and over), many deaths with major preventable factors had occurred. Large numbers of these deaths occurred particularly among infants delivered of mothers on the ward services as nonprivate patients. Hospitals in this group were found to be especially guilty of countenancing major faulty obstetric practices and inadequate early care of the infant, particularly in the delivery room as well as in the newborn nursery. Furthermore, many of the staff members of these hospitals were inclined not to be too cooperative in following the directives of their chiefs of staff. And only too often these chiefs and the hospital administrator did not insist that they adhere strictly at all times to the ordinances of the City of Chicago, the statutes of the State of Illinois, the rules and regulations of the Chicago Board of Health and the Illinois State Department of Public Health, the standards for Hospital Accreditation of the Joint Commission on Accreditation of Hospitals, and the standards and recommendations for hospital care of newborn infants of the American Academy of Pediatrics, as well as to the clear-cut standard practical requirements promulgated by the members of the Joint Maternal Welfare Committee of Cook County.

In group 2 hospitals, in which hebdomadal death rates were in the medium range (10.0 to 17.9), a lesser number of deaths with preventable factors had occurred. However, some of the staff members of these hospitals did not adhere "too well" or "too often" to the ordinances, statutes, rules and regulations, and hospital requirements. In group 3 hospitals, in which hebdomadal death rates were low (from zero to 9.9), deaths with preventable factors had seldom occurred. Furthermore, the administrators insisted that the chiefs of staff see to it that staff members complied closely and continuously with the ordinances, statutes, rules and regulations, and hospital requirements.

The figure representing the total number of hospitals in group 1 that had high hebdomadal death rates of 18.0 and over for the latest month for which death rates are available is inserted each month in the proper square on an explanatory card heading group 1. From these figures, entered month by month, it can be determined whether the total number of hospitals in group 1 has remained the same each month or has increased or decreased. This in turn helps to indicate whether the efforts of the board of health being exerted to control needless hebdomadal deaths in all hospitals are showing the desired results, since a decrease in the number of hospitals in group 1 would tend to indicate that our efforts are producing lowered death rates. The figure representing the total number of hospitals in group 2 that had medium hebdomadal death rates from 10.0 to 17.9 for the latest month for which death rates are available is inserted in the appropriate small square on another explanatory card heading group 2. From these figures, entered month by month, it can be determined whether the total number of hospitals in group 2 has remained the same each month or has increased or decreased. This also helps to indicate whether the efforts of the board of health are producing the desired results.

The figure representing the total number of hospitals in group 3 that had low hebdomadal death rates from zero to 9.9 for the latest month for which death rates are available is inserted in the appropriate small square on still another explanatory card heading group 3. From these figures, entered month by month, it can be determined whether the total number of hospitals in group 3 has remained the same each month or has increased or decreased. This still further helps to indicate whether the efforts of the board of health being exerted to control needless hebdomadal deaths in all hospitals are producing the desired results, since an increase in the number of hospitals in group 3 would tend to indicate that our efforts are producing lowered death rates.

Prior to June, 1954, the monthly hebdomadal death rate cards showed only death rates based on the total of all deaths (in infants under 7 days of age). Many hospital administrators and pediatric and obstetric consultants who observed these data commented that they would be equally interested in knowing the death rates based only on deaths with preventable factors in the institutions with which they were connected. We therefore immediately began calculating the death rates based only on deaths with preventable factors as well as on the total of all deaths and revised the monthly hebdomadal death rate card to include space for entering both rates for the entire year of 1954. Since that time both rates have been entered on the cards. The death rates based only on deaths with major preventable factors obviously are more meaningful in indicating the quality of the hospital's work than the rates based on the total of all deaths, because it is the number of deaths with preventable factors that directly indicate the quality of the hospital's work.

When the hebdomadal death rates, based only on deaths with preventable factors for the first half of 1954, of each of the Chicago maternity hospitals were first studied, it was found that these death rates for the various hospitals also were distributed roughly into three groups: high, medium, and low. The three groups were: 1. The high group, which contained approximately one-third of the hospitals. These hospitals had high hebdomadal death rates of 10.0 and over, or 10 deaths with preventable factors per 1,000 live births. 2. The medium group, which contained about one-third of the hospitals. These hospitals had medium hebdomadal death rates, from 5.0 to 9.9. 3. The low group, which also contained about one-third of the hospitals. These hospitals had low hebdomadal death rates, from zero to 4.9.

Small Colored Wooden Strips: Small wooden strips colored red, green, or gold are used on the master control panel to divide the monthly hebdomadal death rate cards into three groups, to hold the cards in place, and to hold the various tacks showing the rank order numbers of the death rates for the hospitals.

Flashing Red Signal Lights: A flashing red signal light, placed to the left of a hospital's monthly hebdomadal death rate card indicates that one or more hebdomadal deaths known or strongly suspected to have major preventable factors has occurred in that hospital. Such a flashing red signal light indicates that the hospital is under surveillance to determine whether or not faulty practices and procedures have contributed to hebdomadal deaths, or that hebdomadal deaths with preventable factors have occurred and the faulty practices have not been corrected. Thus, the flashing red signal lights enable every member of the staff of the board of health to know at a moment's glance in just what hospitals any deaths with major preventable factors are occurring so that corrective action may be taken.

Date Tags: A date tag is attached to the master control panel around the base of every flashing red signal light, showing the name of the hospital and the date on which a death with known or suspected major preventable factors occurred. The date tag and the flashing red signal light as a unit are removed (1) if on investigation of an hebdomadal death it is determined that there were no major faulty practices in the delivery or early care of the infant, or (2) if major faulty practices and procedures have been found and acceptable assurance is received from the hospital authorities that they have been or are being eliminated at the earliest possible moment. If there is no flashing red signal light and date tag at the left of a hospital's monthly hebdomadal death rate card, it signifies that the hospital is not at present under surveillance because of hebdomadal deaths with known or suspected preventable factors.

Flashing Blue Signal Light: A flashing blue signal light, placed to the left of a hospital's monthly hebdomadal death rate card, and temporarily replacing the flashing red signal light, indicates that the hospital, because of an hebdomadal death with preventable factors, as well as an unsatisfactory record of past hebdomadal deaths, has been chosen by the president of the board of health as the "hospital of the day" to be contacted and informed of the latest hebdomadal death with preventable factors. A conference may be held with the hospital administrator and perhaps the chiefs of obstetrics and pediatrics, aimed at trying to determine if a bad habit pattern has developed in members of the staff of that hospital and how these bad practices may be corrected.

Flashing Gold Signal Light: A flashing gold signal light placed to the left of a hospital's monthly hebdomadal death rate card is an indication of special merit. It calls to the attention of the entire staff of the board of health the fact that the hospital administrator and the members of the obstetric and pediatric staffs have successfully exerted wholehearted effort to improve the obstetric, newborn nursery, and pediatric services of that hospital, which has previously been under surveillance. Furthermore, it shows that the hospital is following strictly and wholeheartedly the statutes, ordinances, rules and regulations.

Large Tacks: Tacks of various colors and shapes are used on the master control panel to show the rank order of the hebdomadal death rates for each of the 49 maternity hospitals licensed by the City of Chicago. The rank order of the death rates is shown by numbers on the tacks (fig. 7). The Board of Health inspects and approves licensure of 49 hospitals in the City of Chicago that have maternity divisions. In addition, there are three maternity hospitals that are not under the jurisdiction of, inspected by, or licensed by the Chicago Board of Health but are under the jurisdiction of and licensed by the State of Illinois: These are Cook County Hospital, University of Illinois Research and Educational Hospitals, and the Municipal Tuberculosis Sanitarium. The monthly hebdomadal death rate cards for these three hospitals that are not licensed by the City of Chicago are in a separate group, although what their position in the three main groups would be is designated by appropriate small, colored wooden strips and round red, green, or gold tacks. To the number on the red, green, or gold round tack for each of these hospitals is affixed the letter "A," which means that the rank order of the hospital's death rate follows that of the hospital shown by the number on the tack.

This is done so that we may be cognizant of their death rates, since the deaths in these three hospitals are included in calculating the total death rates in the City of Chicago because they are deaths that actually occurred in Chicago. However, we are not vested with the power to control these hospitals' rates as we are for the other 49 hospitals.

Red, green, and gold tacks are used for the group of death rates based on the total of all deaths, both with preventable and/or nonpreventable factors. The colors red, green, and gold indicate whether the death rate for which the rank order is shown was high, medium, or low respectively. Black, blue, and gray tacks are used for the group of death rates based only on deaths with preventable factors. The colors black, blue, and gray indicate whether the death rate for which the rank order is shown was high, medium, or low respectively. A round tack is used when the rank order is for the death rate of a monthly period, a square tack for the cumulative death rate, and a triangular tack for the death rate of a 12 month period. The tacks are inserted on the small colored wooden strip directly above each hospital's monthly hebdomadal death rate card; round tacks on the left end, square tacks in the middle, and triangular tacks on the right end.

Monthly Date Card: The latest month for which monthly and cumulative hebdomadal death rates are available is shown in the upper left hand corner of the master control panel.

Alphabetical Listing of Hospitals: In the upper right corner of the master control panel, is an alphabetical listing of the names of the Chicago hospitals that have maternity divisions. One of the important purposes of the alphabetical listing is to make it possible to locate easily the position on the master control panel of the monthly hebdomadal death rate card of any hospital, so that anyone interested in the death rates of a specific hospital can locate that card quickly for study. To locate the monthly hebdomadal death rate card of any hospital, one must first find the name of the hospital on the alphabetical list. The latest month of the current year for which death rates are available must be noted. Under the name of this month on the alphabetical listing, the square for each hospital has been colored red, green, or gold, and a number (from 1 to 49) representing the rank order of the hospital's death rate for that month has been inserted. The color red, green, or gold shows whether that hospital's card is to be found in the first, second, or third group on the panel. The number in the colored square gives the actual location of the card for that month. This number is the same as that recorded on the red, green, or gold round tack located on the left end of the small colored wooden strip directly above the hospital's card.

Stop and Go Light: Above the alphabetical listing of the hospitals, on top of the master control panel, is a miniature stop and go light. A red arrow from this light points to the column showing the most recent available monthly listing of hebdomadal death rate rank orders based on the total of all deaths. This flashing stop and go light calls special attention to those hospitals that require continued surveillance because their death rates during the latest month for which death rates are available are high.

Central Office File of Hebdomadal Death Records.—Immediately adjacent to the master control panel is a file that contains pertinent data relating to each hebdomadal death, filed immediately upon receipt under the name of the hospital in which the birth of the infant who died occurred. The purpose of the data is to make available at all times information concerning preventable factors in hebdomadal deaths. Included are: (1) a copy of the birth certificate; (2) a matching copy of the death certificate; (3) a complete summary of the record prepared by the audit units of the board of health, consisting of a team of obstetricians, pediatricians, nurses, and clerical workers; (4) a notification of death suspected of having preventable factors form (fig. 1), noting the pres-

ence of preventable factors, if any, associated with the death, filled out by the chief supervising physicians of the obstetric and pediatric units; (5) any letters, memorandums, and records of meetings and telephone conversations relative to the death; and (6) all other important information received concerning the death.

Known Needless Death Panel.—The threefold purpose of the known needless death panel is to make information immediately available to show (1) which hospitals have taken the necessary action to keep deaths with major preventable factors from occurring, (2) which hospitals have physicians on their staffs who have developed a habit pattern of faulty practices, and (3) what progress the board of health is making in controlling hebdomadal mortality by the use of the alerter system. This panel follows in detail the features of the master control panel, except that the death rates shown month by month are based only on deaths with preventable factors. Instead of the colors red, green, and gold as used on the master control panel, the colors black, blue, and gray are used on the tacks and wooden strips.

"Premature" Panels.—The system also includes two detailed panels for the special study of hebdomadal deaths of premature infants. The purpose of these panels is to point up the need for the special attention required in the early care of premature infants. They provide a means of studying in detail the hebdomadal death rates of premature infants in various weight groups for the individual hospitals.

Individual Hospital Alerter Panel.—An individual small panel has been prepared for distribution to each maternity hospital in Chicago, reproducing the information found on the monthly hebdomadal death rate card of that hospital. The average cumulative hebdomadal death rates for all maternity hospitals in Chicago and the average rates for those hospitals with outstandingly low rates are shown also, for comparison.

Graphs of Hebdomadal Death Rates.—Line graphs showing the cumulative hebdomadal death rates by month for both 1953 and 1954 are prepared for each maternity hospital. The lines on each graph show: (1) total death rates, (2) death rates for infants weighing over 1,000 gm. at birth for 1953 and 1954, and (3) the rates for deaths with preventable factors in 1954 (fig. 2). A second graph is prepared for each maternity hospital, showing the individual monthly hebdomadal death rate and the number of premature infants born in that hospital each month (fig. 3). Since the rates for each individual month usually vary considerably, it is important to have some means to indicate a general trend. It was, therefore, necessary to prepare a third graph on the basis of a moving average. A 12-month moving average was decided upon in order to obtain a smooth curve, which would immediately alert us to the general direction in which the hebdomadal death rate was progressing (fig. 9).

RESULTS OF ALERTER SYSTEM

Use of an alerter system was begun at the Chicago Board of Health early in January, 1954, in an attempt to achieve a reduction in the continuing needless hebdomadal deaths. The results achieved by the use of such an alerter system are clearly shown by, first, a comparison of the number of maternity hospitals with high hebdomadal death rates of 18 deaths per thousand live births and over, based on the total of all hebdomadal deaths during the entire 12 months of 1953 (before the alerter system was in operation), with the number of hospitals having these high death rates of 18 and over during the entire 12 months of 1954 (after the alerter system was in operation).

Second, it was shown by comparison of the number of hospitals with high hebdomadal death rates of 10 and over, based only on deaths with preventable factors during the first six months of 1954, with the number of hospitals having these high death rates during the last six months of 1954. Comparison of deaths with preventable factors for 1953 could not be made, since figures for these deaths were not available for 1953.

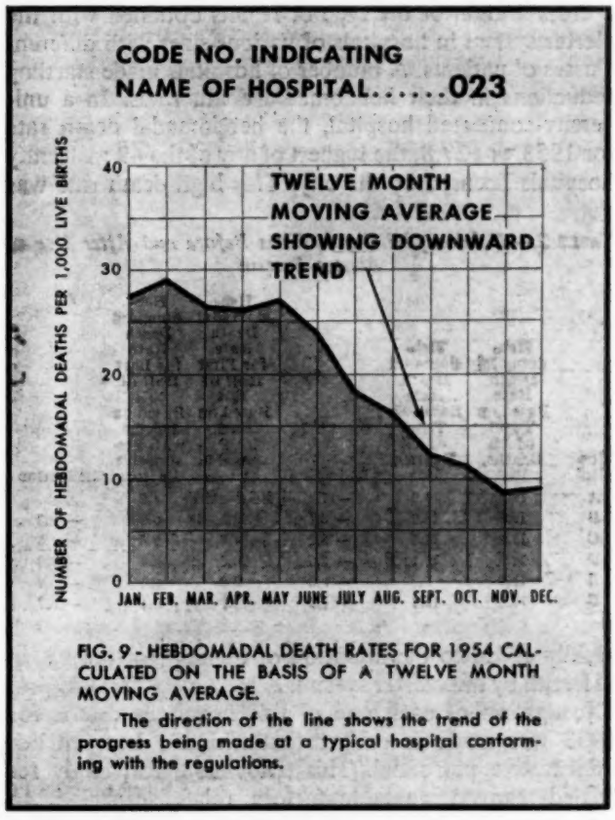


FIG. 9 - HEBDOMADAL DEATH RATES FOR 1954 CALCULATED ON THE BASIS OF A TWELVE MONTH MOVING AVERAGE.

The direction of the line shows the trend of the progress being made at a typical hospital conforming with the regulations.

It was discovered that hebdomadal deaths with preventable factors usually constituted about 60% of the total of all hebdomadal deaths. Since we considered a death rate of 18 for a hospital as high when the rate is based on the total of all deaths, we considered a death rate of 10 (about 60% of 18) as high when the rate is based only on deaths with preventable factors. Third, results of the use of the alerter system were shown by a study of the death rates of the individual hospitals for 1953 and 1954, which study was based on a thorough epidemiological investigation of each hebdomadal death.

Number of Hospitals with High Death Rates Before and After Use of the Alerter System.—Before the institution of the alerter system, there were 17 hospitals in Chicago with high hebdomadal death rates of 18 or over per thousand live births (based on the total of all

deaths) for the entire year 1953. After the alerter system had been in operation, there were only eight hospitals with hebdomadal death rates of 18 or over for the year 1954. For the first six months of 1954, when figures for such deaths were first available, there were 23 hospitals with high hebdomadal rates of 10 or more for deaths with preventable factors. For the last six months of 1954, there were only 12 hospitals with death rates of 10 or over for deaths with preventable factors. For the first six months of 1954, the death rate for all hebdomadal deaths with preventable factors was 10.0. For the last six months of 1954, this rate was 7.6.

Progress Made by Hospitals with High Hebdomadal Death Rates.—The following data concerning the progress made in reducing high hebdomadal death rates give a cross section of the type of results obtained with the alerter system in hospitals of various sizes with different classes of patients. A number of hospitals made startling reductions in their hebdomadal death rates. In a university-connected hospital, the hebdomadal death rate for 1953 was 27.8, the highest of any of the 49 maternity hospitals licensed by the city. This high death rate was vividly called to the attention of the staff of the board of health by our alerter system. A careful epidemiological investigation of each one of this hospital's deaths for 1953 was made in cooperation with the hospital administrative personnel. This epidemiological study revealed many preventable factors, related especially to the early pediatric care of infants in the newborn nursery.

TABLE 2.—*Hebdomadal Death Rates Before and After Use of Alerter System*

Hospital	Hebdomadal Death Rate Based on Total of All Deaths, 1953	Hebdomadal Death Rate Based on Total of All Deaths, 1954	Reduction	Hebdomadal Death Rate for First Half of 1954 Based on Deaths with Preventable Factors	Hebdomadal Death Rate for Last Half of 1954 Based on Deaths with Preventable Factors	Reduction
A	18.9	1.9	—17.0	No deaths	4.2	.....
B	18.3	15.2	— 3.1	16.2	6.9	— 9.3
C	18.0	14.8	— 3.2	7.8	3.5	— 4.3
D	18.3	15.1	— 3.2	20.2	3.4	—16.8
E	11.5	5.2	— 6.3	3.6	3.4	— 0.2
F	17.2	12.6	— 4.6	16.1	6.4	— 9.7

Early in 1954, the detailed reports of faulty practices revealed by this investigation were transmitted to the hospital by the board of health. When these facts, determined by the epidemiological investigations, were pointed out to the chairman of the department, to the chief of the obstetric staff, and to the hospital administrator, they were quick to realize the advisability of instituting certain corrective measures to eliminate faulty practices and procedures in the early care of infants in the maternity division and especially during the first 15 minutes after birth. All of these corrective measures aided in producing a precipitous decline in the hospital's hebdomadal death rate, from their previous high of 27.8 in 1953, to a low of 10.2 in 1954, one of the lowest rates of all of the hospitals and the greatest decrease made by any hospital in the city. The death rate in premature infants in this same hospital was reduced from 189.0 in 1953, to 105.3 in 1954, or 44%, while the death rate for full-term infants was reduced from 9.6 in 1953, to 3.6 in 1954, or 63%. Furthermore, such few hebdomadal deaths as did occur during the latter months of 1954 were for the most part not revealed by our epidemiological investigations to have any discoverable preventable factors.

Different preventable factors were found at another large hospital, one with an extensive ward service. Its hebdomadal death rate for 1953 was 20 per thousand live births, the fifth highest in the city. The preventable factors revealed by a study made in January, 1954, of this hospital's hebdomadal deaths for 1953 consisted of such things as the administration of general anesthesia and analgesics in premature deliveries, delivery of ward patients by unsupervised and insufficiently trained residents and interns, and failure to provide acceptable early care in the newborn nursery by pediatric specialists or even by any licensed physician. These conditions were called to the attention of the hospital administrator and chiefs of the obstetric and pediatric staffs in February, 1954, when the epidemiological study was completed. This hospital also at once instituted certain corrective measures to eliminate all of these preventable factors, and the cumulative hebdomadal death rate (based on all deaths) has been reduced from a high of 20.0 in 1953 to a low of 10.2 in 1954, a decrease of 50%.

In another large, well-established hospital, the hebdomadal death rate of 23 (based on all deaths) for the year 1953 was the third highest in the city. At the end of February, 1954, this rate had risen to 30. Early in March, the epidemiological investigation of this hospital's deaths was begun, and early in April, the data were presented to the hospital administrator and chiefs of the obstetric and pediatric staffs. This hospital, as did all others, reacted promptly and cooperatively to the information relayed by the board of health. With the immediate institution of corrective measures by these chiefs of staffs and the hospital administrator, the total hebdomadal death rate began to decline, and the total rate for 1954 was only 15 per thousand live births compared with the rate of 30 in February, a decrease of 50%.

The hospital with the second highest rate in the city for 1953 also reduced its rate remarkably. The total hebdomadal death rate at the end of 1953 was 25.1. The epidemiological investigation of this hospital's deaths revealed that the chief difficulties were unindicated induction of labor, use of general anesthetics and analgesics in the delivery of smaller premature infants, failure to provide care by a pediatric specialist for sick and premature infants, and failure to have a team of physicians immediately available for administration of exchange transfusions in infants with erythroblastosis. These facts were presented to the hospital early in 1954, and their death rate thereafter rapidly declined, so that for the entire year of 1954 it reached a low of 9.4 per thousand live births, a 63% reduction.

Good results were also achieved in reducing the hebdomadal death rate based on the total of all deaths, as well as the death rate based only on deaths with preventable factors. The figures given in table 2 for institutions (designated A to F) give a good general idea of the situation prior to and after the institution of the alerter system.

Improved Attitude of the Hospitals Toward Program.—To encourage the cooperation of the hospitals, epidemiological investigations of hebdomadal deaths to discover those with preventable factors were made only by specially trained experts in obstetrics and pediatrics. After such deaths are found, it requires diplomacy and tact to present the data in such a manner to the hospital administrator and medical staff that they will wholeheartedly cooperate to eliminate similar deaths in the future. These deaths can be eliminated by correcting all faulty practices. None of these institutions wanted to have needless deaths, but they just were not aware of their occurrence. We have only once encountered resistance at any institution to adherence to the regulations that required revocation of the hospital license, but rather we have met with excellent cooperation and helpful assistance on the part of the hospital administrators and chiefs of the obstetric and pediatric staffs.

COMMENT

Extensive studies and analyses of hebdomadal deaths have shown the following general facts. 1. All who share the responsibility for preventing these needless deaths were not aware in the past that so many preventable deaths were occurring and hence did not make an effort to discover why they were occurring. Moreover, we did not make the concerted effort necessary to determine how to keep such deaths from occurring nor did we take the appropriate action to prevent them. 2. In a large number of deaths in infants under 7 days of age during their initial hospital stay there are a number of preventable factors, many relating to errors in techniques and errors in judgment. 3. Too many newborn infants die because the already known necessary steps are not taken to keep them from dying. 4. Complete epidemiological investigations of all hebdomadal deaths must be made to determine why these deaths are occurring and to find the measures necessary to keep them from occurring. Since nearly all of the deaths of infants during the early days of life occur in the hospital in which the infant was born, there is at this time an urgent need for intensifying the effort to improve the quality of obstetric and pediatric services rendered in hospitals. The alerter system herein described in detail (a recent development in public health), one of the most important phases of the present Chicago public health program to prevent needless hebdomadal deaths, fulfills this urgent need. The usefulness of the program embodying the alerter system has been demonstrated by our extensive experience with it during the past year.

7410 Oglesby Ave.

DEVELOPMENT OF ANALGESIA AFTER A CENTURY OF ANESTHESIA

John S. Lundy, M.D., Rochester, Minn.

A new, safer, more pleasant era in the art and science of pain relief may not be too far in the future. On July 30, 1953, I produced in three persons a state I have tried to bring about before, sometimes successfully. Using a new drug, Dolitrone (5-ethyl-6-phenyl-meta-thiazane-2, 4-dione), I brought about this much-sought state—a general condition in which the patient retains some consciousness, but at the same time sensibility to pain is so reduced that the patient can tolerate some operative pain. The patient may not remember anything of the operative procedure and will not have been hurt enough to complain, then or later. A patient who exemplifies this state at a superficial level might be able to sleep in spite of icteric pruritus. I thought that a badly burned patient, if placed in this same state, but at a more profound level, might be made comfortable. Now, Dr. Paul H. Lorhan,[1] of the University of Kansas Medical Center, has written that on June 1, 1954, he used this new drug to make change of dressings bearable to a 3-year-old child who had sustained third degree burns over 25% of her body. Use of other preparations had not had the desired effect unless the child was anesthetized. When this new drug was used, however, the patient would straighten a leg on command but remain in a state of general analgesia. At a still deeper level of this state, a patient might remain, through a distinctly painful operation, sufficiently conscious to allow him to swallow or open or close his eyes on command. To designate that state, I have been obliged to use a term that has varying significance to various persons. I have called it "analgesia." If an etymologist would suggest a new and more precise term, such as that Oliver Wendell Holmes offered to Morton on Nov. 21, 1846,[2] I, and doubtless others, will welcome the contribution. Because of the pronounced forgetfulness of recent events that attends use of the new drug, Victor Cohn[3] has suggested the term "controlled amnesia."

HISTORY OF GENERALIZED PAIN RELIEF

Three periods in the science and art of pain relief can be distinguished. The boundaries are not absolute; an experience in one period foreshadows that in a later period.

General Anesthesia.—The first period was that in which various agents were used to produce general anesthesia. The patient was unconscious, and tactile sensibility was abolished. In spite of a lay observation that might have directed attention elsewhere, early in the use of ether for surgery the agent was used in an anesthetic dose. The habit to use it then became more or less

---

From the Section of Anesthesiology and Intravenous Therapy, Mayo Clinic and Mayo Foundation.

Read before the General Scientific Meetings at the 103rd Annual Meeting of the American Medical Association, San Francisco, June 22, 1954.

The section on chemistry in this paper was prepared by Harold W. Werner, Ph.D., of the Wm. S. Merrell Company, Cincinnati.

The Mayo Foundation is a part of the Graduate School of the University of Minnesota.

1. Lorhan, P. H.: Personal communication to the author.
2. Keys, T. E.: The History of Surgical Anesthesia, New York, Henry Schuman, Inc., 1945, p. 30.
3. Cohn, V., in the Minneapolis Morning Tribune, June 8, 1954.

fixed. In obstetrics, sometimes varying degrees of analgesia were effected by the intermittency of administration of the ether, but the aim in this field was usually to produce anesthesia. With chloroform the experience was much the same. In nitrous oxide jags, the gas was administered, as ether had been, for amusement only. In surgery, however, in the early years of the use of this gas, the purpose was to bring about anesthesia, even for extraction of teeth. Ethylene and cyclopropane always have been used mostly as anesthetics, and efforts to use them an analgesics have not been very seriously considered. In this period of anesthesia, even late in the period, the state of relaxation sometimes was insufficient to allow the surgeon to operate as gently and safely as personal standards demanded. In an attempt to gain satisfactory relaxation by deeper anesthesia, occasionally a patient was lost.

Use of Relaxants.—Death of a patient from deeper anesthesia led to the second of the three periods. Really it was a subdivision of the first and third periods, and it may be thought of as the era when relaxants were used. The purpose generally was to bring about satisfactory relaxation of the patient who was unconscious from the effect of general anesthetic agents. This was the main purpose of balanced anesthesia. During the years in which I used balanced anesthesia, I sometimes produced analgesia. Almost always, however, there was something undesirable about the result. If the main agent was nitrous oxide, the patient was likely to become cyanotic or to move. If the preponderant agent was something else, administration of a relatively small dose of it would be accompanied by some unsatisfactory phenomenon that could be banished by increasing the dose. Then the patient became quiet and satisfactorily oxygenated—but he was under anesthesia. It was a satisfactory state of anesthesia but not as safe as was desired. In order to increase the relaxation without increasing the depth of anesthesia, preparations of curare and other relaxants were introduced. More recently still, introduction of antagonists to some of the relaxants rendered them safe to use. The quiet but unremitting search for safety that has been conducted by pharmacologists, pharmaceutical manufacturers, and anesthesiologists fairly recently resulted in the development of an antidote even for morphine, nalorphine hydrochloride, derived from the oldest analgesic of them all, opium.

Analgesia.—The third period, then, that of analgesia, really was entered ages ago, but the significance of what was observed a little more than a century ago generally went unrecognized. I am thinking of the lay observation, that conscious participants in ether jags sometimes remained unaware of accidental trauma to themselves. At present, the analgesic effect of diethyl oxide, reinforced with other agents, is under investigation. Efforts to produce analgesia, however, have been concerned, in one way or another, with nitrous oxide. As far back as 1868, Edmund W. Andrews [4] suggested mixing nitrous oxide with oxygen, rather than with air. But nitrous oxide, whether it was mixed with air or with oxygen, seldom gave entirely satisfactory results. One or more additional agents were generally necessary. Thus, for obstetric or dental use, a sedative was given first, and the patient was supplied with a device for self-administration of nitrous oxide and oxygen. This method had drawbacks and never became accepted in all quarters. Nevertheless, it did show that nitrous oxide could be used for analgesia, particularly if reinforced with something else.

One of the more recent efforts along that line was described in 1947 by Neff and others.[5] They supplemented the anesthesia produced by nitrous oxide and oxygen, and other anesthetic agents, by slow, intravenous administration of meperidine (Demerol) hydrochloride in repeated small doses. Since that time a considerable bibliography has been built up concerning the use of meperidine hydrochloride, particularly with nitrous oxide. The general conclusions concerning use of this combination in obstetrics, surgery, and endoscopy are that it (1) produces a high degree of analgesia, (2) relaxes smooth muscle, (3) prevents laryngeal spasm on intubation, (4) exerts a short sedative effect, allowing "rapid return to consciousness with delayed postoperative pain," and (5) has little undue effect on respiration and blood pressure. Vinyl ether (Vinethene) alone, or with nitrous oxide, has been used to produce analgesia for short operations. Also, trichloroethylene alone or with nitrous oxide has been used for analgesia for short periods. It has been used for anesthesia, but even anesthesia of moderate duration has resulted in at least one death. Nitrous oxide has been fortified with morphine, scopolamine, methadone hydrochloride, and levorphan (Levo-Dromoran) tartrate, all of the latter group given hypodermically, and, depending on the dose of the narcotic, varying degrees of analgesia have resulted. Anesthesiologists, therefore, long have been in a position to investigate the analgesic effects of small doses of anesthetic agents combined with narcotics or other agents.

USE OF DOLITRONE IN ANALGESIA

That is the position I found myself engaged in on July 30, 1953, when I injected MRD-125, now known as Dolitrone, into a vein of a volunteer person. In order to determine what effect the drug was having, I caused the conscious person's arm to be pricked with a pin but he did not move, an effect I had not elicited that soon with any other general anesthetic agent. If this drug could anesthetize the skin like that, I thought it ought to be effective in the distribution of the trigeminal nerve, which innervates both skin and teeth. Consequently, I administered Dolitrone intravenously to two patients who were to undergo extraction of teeth.[6] When they were fully analgesic, they still would swallow and open and close their eyes on command. There was no torture or pain. This medicament had more analgesic qualities, in smaller dose, than any I had used before. Recovery, furthermore, was particularly prompt. My associates and I now have

4. Keys, T. E., in Lundy, J. S.: Clinical Anesthesia: A Manual of Clinical Anesthesiology, Philadelphia and London, W. B. Saunders Company, 1942, p. 709.

5. Neff, W.; Mayer, E. C., and de la Luz Perales, M.: Nitrous Oxide and Oxygen Anesthesia with Curare Relaxation, California Med. **66**: 67-69 (Feb.) 1947.

6. Anesthetics, Local and General, Chem. & Engineering News **32**: 1323 (April 5) 1954. Lundy, J. S.: 110 Years of Anesthesia, J. M. A. Georgia **43**: 195 (March) 1954; Will There Be an Era of Analgesia? editorial, Journal-Lancet **74**: 155 (April) 1954. Thompson, C. R.; Smith, J. K., and Werner, H. W.: Pharmacology of 5-Ethyl-6-Phenyl-M-Thiazane-2,4-Dione, Fed. Proc. **13**: 411 (March) 1954.

impressions gained in 112 cases (fig. 1) in which Dolitrone has given evidence of its analgesic effect, especially when preliminary medication was given.

When Hyatrobal (a mixture of pentobarbital sodium, atropine sulfate, and scopolamine hydrobromide) and methadone hydrochloride have been given preliminary to an injection of Dolitrone, the result has been marked analgesia. The analgesic dose of Dolitrone, moreover, when it is administered after Hyatrobal and methadone

Category		Dolitrone											Totals	
			With premedication								Without premedication, but with nitrous oxide and oxygen			
				And nitrous oxide and oxygen					And curare. No nitrous oxide or tube					
		Alone			And tube	And Anectine* and tube	And curare	And tube			And tube		
Age, years	10 to 20		5	15	3	1†				1			25	112
	21 to 40	2	13†‡	29	5	6	1	2		1	3		59	
	41 to 60	2	4	8	7				1				22	
	61 and more	1	1	3	1								6	
Type or region of operation	Dental	4	21†	53	11	7†		2		2	3		103	
	Eye			1	2		1						4	
	Dilatation and curettage			1									1	
	Radium to uterus		1										1	
	Anal papilla								1				1	112
	Bilateral chem. splanchnic block	1											1	
	Caldwell operation		1†										1	

*Anectine is succinylcholine chloride.
†In 1 case, Pentothal given after supply of Dolitrone exhausted.
‡In 1 case, premedication followed by topical and regional anesthesia, supplemented by Dolitrone.

Fig. 1.—Experience with Dolitrone in 112 patients (27 males and 85 females) from July 30, 1953, through May 31, 1954.

hydrochloride and is accompanied by 70% nitrous oxide and 30% oxygen, is only a third of that required to produce a similar effect when the preliminary medication and the adjuvant nitrous oxide and oxygen are omitted. After small doses of Dolitrone have been administered, nystagmus may occur. I have seen the same reaction occur after small doses of thiopental (Pentothal) sodium. This can be taken as a sign that a small dose has been given. Administration may be continued safely, until anesthesia supervenes.

In 103 of the 112 cases the operation was dental extraction. Results were substantially those obtained in the two cases previously described. One of these 103 cases was particularly interesting. A 73-year-old patient with a fractured hip was the subject of a demonstration, on April 15, 1954, before a group of physicians who were taking refresher courses at the University of Kansas Medical Center. This patient needed some teeth extracted while in the hospital and, for this purpose, she was moved from her room to the operating room. Movement caused pain to her, and she complained of it even after the usual preliminary medication had been given. The pain ceased, however, after she received a dose of Dolitrone that was too small to allow dental extraction or to cause her to stop talking. Nine of the 112 cases were not in the dental category. In one of these nine patients the operation was performed on the ocular muscles. Results were no better than those obtained in such cases with thiopental sodium and curare. In another patient, dilatation and curettage were performed. In the course of this procedure, electrocardiograms and electroencephalograms were obtained.

In order to obtain the numerical information necessary for figure 1, collection had to stop on a given date. In this preliminary report, however, I should add that, more recently, Dolitrone has been used in four patients for hemorrhoidectomy in addition to the patient who had an operation on an anal papilla (fig. 1). In three of the five patients only one injection of morphine was required for postoperative pain; in the fourth and fifth patients none was required. In one of these cases the patient lay face down, and the analgesic solution was injected into a dorsal vein of a hand. Because of the patient's position, venous return was imperfect and the mixture of blood and solution pooled in the vein. Chemical phlebitis resulted. Twenty-four hours after the operation, swelling, pain, and warmth were slight but yielded to application of heat. Probably the pooled mixture should have been milked upward or the hand and arm elevated. In one other patient in addition to the series of 112, an abdominal operation was performed. The intestine, viewed between retracted rectus muscles that were not relaxed, was flat, was easily packed out of the operative field, and showed no disposition again to protrude into it. Early work on electroencephalography when anesthetic drugs were being administered was done by Dr. Albert Faulconer Jr., and associates.[7] The electrocardiograms and electroencephalograms made in the case in which dilatation and curettage were performed, and which has been mentioned, are represented in figure 2.

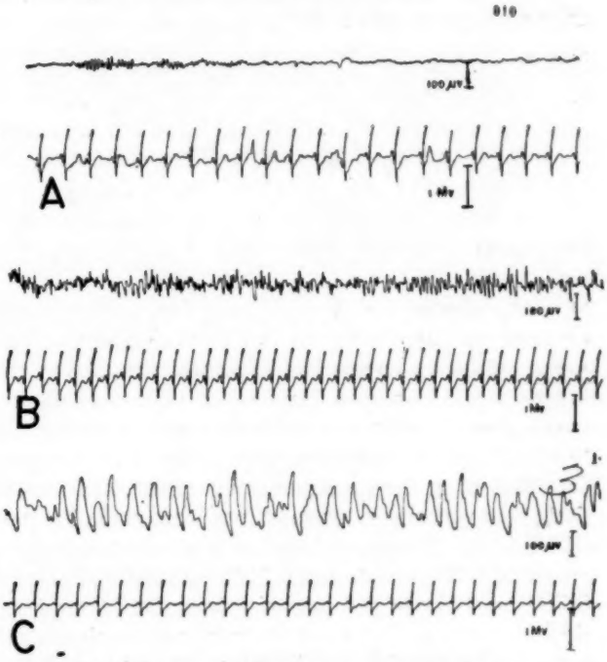


Fig. 2.—Control electroencephalogram (above) and electrocardiogram (below): *A*, before Dolitrone was administered to a patient about to undergo dilatation and curettage; *B*, when patient had reached the stage of analgesia effected by a small dose of Dolitrone; and *C*, when patient had reached the stage of deep anesthesia effected by a large dose of Dolitrone.

Dolitrone, besides being an analgesic drug, is an anesthetic drug. When Dolitrone is used for general anesthesia, there seems to be little depression of respiration. Blood pressure, pulse rate, and the electrocardiogram remain substantially unaffected. The electroencephalo-

7. Courtin, R. F.; Bickford, R. G., and Faulconer, A., Jr.: The Classification and Significance of Electro-Encephalographic Patterns Produced by Nitrous Oxide-Ether Anesthesia During Surgical Operations, Proc. Staff Meet., Mayo Clin. **25**: 197-206 (April 12) 1950. Kiersey, D. K.; Bickford, R. G., and Faulconer, A., Jr.: Electro-Encephalographic Patterns Produced by Thiopental Sodium During Surgical Operations: Description and Classification, Brit. J. Anaesth. **23**: 141-152 (July) 1951. Possati, S.; Faulconer, A., Jr.; Bickford, R. G., and Hunter, R. C.: Electroencephalographic Patterns During Anesthesia with Cyclopropane: Correlation with Concentration of Cyclopropane in Arterial Blood, Anesth. & Analg. **32**: 130-135 (March-April) 1953.

gram, as long as Dolitrone is used for analgesia, resembles that obtained when thiopental sodium is used. It changes, when the Dolitrone has caused general anesthesia, to one somewhat like that caused by cyclopropane. Bleeding seems to be lessened, as noted by Dr. Louie T. Austin,[8] in patients with oral surgery. Dr. T. H. Seldon [9] has some experimental evidence on it. With the aid of a Clark window, he observed the capillaries in the rabbit's ear (fig. 3). He believes that when Dolitrone is administered, the capillaries, as when nitrous oxide and oxygen are used, are smaller than when such drugs as ether, cyclopropane, ethylene, or thiopental sodium are given. In a few patients in whom Dolitrone has been used, the skin temperature of the great toes and of the right calf has been determined with thermistors; the general rise in temperature was slight unless premedication had been given.

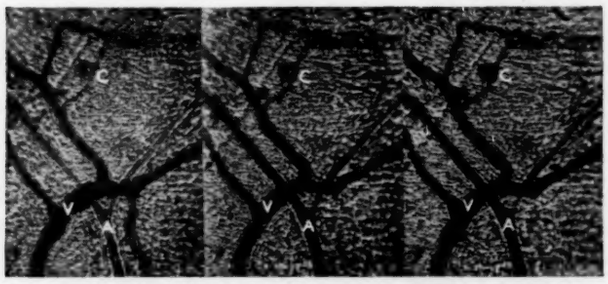


Fig. 3.—Capillaries (*C*), veins (*V*), and arterioles (*A*) as seen in a rabbit's ear through a Clark window. *Left*, before Dolitrone had been given. *Center*, five minutes after Dolitrone had been given. *Right*, 10 minutes after Dolitrone had been given.

Other pertinent, but as yet limited, data were obtained in a series of cases in which Dr. T. M. Terpinas [10] and I were producing anesthesia for dental extraction. The patients inhaled accurate mixtures of nitrous oxide and oxygen, the oxygen content of which was variously 13, 15, 17, 19, and 21%. In the table, groups 1, 2, 3, 4, and 5 correspond to the percentages just given. Before any other agent was added, observations were made for control purposes. Thiopental sodium was administered intravenously. With a decrease in the percentage of oxygen and an increase in that of nitrous oxide, less and less thiopental sodium was needed to produce anesthesia and a quiet patient. After Dr. Terpinas had observed 100 patients and while his apparatus was still assembled, I asked that he observe 25 more patients but that he substitute Dolitrone for thiopental sodium. This he did and compared the last 25 of his 100 patients who had received thiopental sodium with the 25 who had received Dolitrone (fig. 4). He was able to show that the arterial oxygen saturation when Dolitrone was used always was equal to or was much more than that when thiopental sodium was used. This may be because respiration is depressed more by thiopental sodium than by Dolitrone. However, both groups of patients received adequate oxygen. The 25 patients who received Dolitrone under the observation of Dr. Terpinas are included in the 112 cases of figure 1.

Additional favorable effects have been that relaxation has been much better with Dolitrone than with nitrous oxide alone; this is true either of analgesic or anesthetic doses. Also, with the patient anesthetized, introduction through the nose or mouth of an endotracheal tube into the larynx and trachea has been relatively easy. Laryngeal spasm usually has been absent. Unfavorable effects of Dolitrone, when used as an anesthetic agent, sometimes are seen. Thrombophlebitis occurs but in almost negligible frequency. Brief nausea has occurred after operation in some cases, but not in any in which Hyatrobal has been used. As yet, to put Dolitrone into solution, the solvent must be more alkaline than it should be. The alkalinity is by no means an unheard of degree, for the pH of a 2.5% solution of Dolitrone is 11.4, whereas that of a 2.5% solution of thiopental sodium is 10.4. Progress, however, is being made to decrease alkalinity of the solution. The question will be asked whether tolerance or sensitivity can be expected to develop when Dolitrone is used. I have given it twice to only one patient. No signs of either tolerance or sensitivity were evident.

Dolitrone Anesthesia in Twenty-Five Patients

Group	Partial Pressure O_2 in a Cylinder of N_2O and O_2, Mm. Hg	Arterial Saturation, %		Dolitrone, Mean Mg.		Length of Operation, Min.	
		Range	Mean	Total	Per Min.	Range	Mean
1	95 (O_2 13%)	72-97.5	91.5	405	28.5	7-28	14.2
2	110 (O_2 15%)	71-98.5	94.0	485	26.1	4-33	18.6
3	125 (O_2 17%)	84-98.5	95.5	320	32.7	4-17	9.8
4	139 (O_2 19%)	86-99	94.8	370	39.4	3-17	9.4
5	154 (O_2 21%)	91.5-99	97.0	615	56.9	3-19	10.8

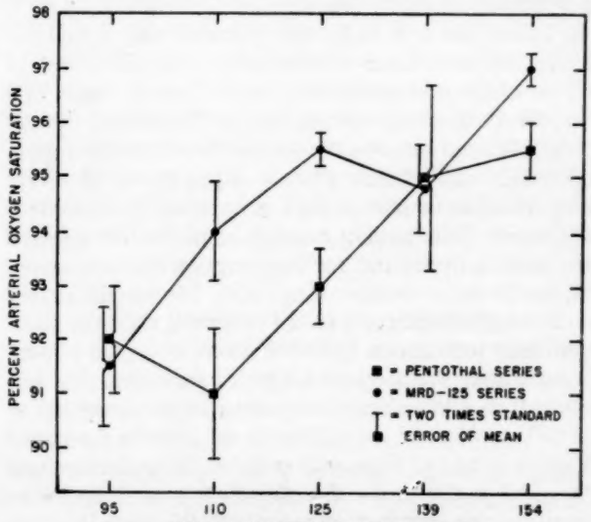


Fig. 4.—Arterial oxygen saturation at various partial pressures of oxygen (in a mixture of oxygen and nitrous oxide), in cases in which thiopental (Pentothal) sodium and Dolitrone were each given intravenously.

CHEMISTRY

The chemical structure of Dolitrone is shown in figure 5. The chemical formula is 5-ethyl-6-phenyl-meta-thiazane-2,4-dione, wherein meta-thiazane signifies a six-

8. Austin, L. T.: Personal communication to the author.

9. Seldon, T. H.: The Effect of General Anesthetic Agents on Small Blood Vessels, Thesis, University of Minnesota Graduate School, 1940.

10. Terpinas, T. M.: An Investigation of the Oxygen Saturation of Arterial Blood During Anesthesia for Oral Surgery as Determined by the Modified Millikan Oximeter, Thesis, University of Minnesota Graduate School, 1954.

membered heterocyclic ring containing one atom each of sulfur and nitrogen and four carbon atoms, the sulfur and nitrogen atoms being in the meta or 1,3-positions relative to each other. The ending ane signifies a saturated ring. In the structural formula the sulfur atom is in position 1. Thus, the ethyl group is in position 5, the phenyl group is in position 6, and the keto (=O) groups are in positions 2 and 4, as is indicated by the 2,4-dione element of the name.

Preparation.—The compound is made by the series of reactions represented in figure 5. The impure product can be recrystallized one or more times from organic solvents, such as chloroform or mixtures of ethyl alcohol and petroleum ether. The pure, dried product melts at about 160 to 162 C (320 to 324 F). As yet, the supply is insufficient, but the manufacturer is improving this situation.

Physical and Chemical Properties.—The pure compound is a white, crystalline powder. It is only slightly soluble in water, but is readily soluble in most of the

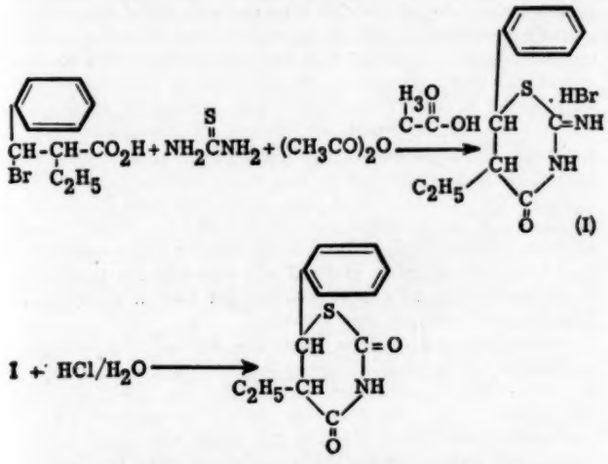


Fig. 5.—Series of reactions by which Dolitrone is formed.

ordinary organic solvents such as ether, ethyl alcohol, acetone, benzene, and chloroform. The compound exhibits no basic properties; instead, it is a weakly acidic substance. Consequently, it will not dissolve in dilute mineral acids, but it does form water-soluble salts with the alkali-metal hydroxides and dissolves in an equivalent amount (or an excess) of sodium hydroxide, potassium hydroxide or lithium hydroxide. It appears to form water-insoluble salts with calcium, magnesium, or barium. It forms water-soluble salts with organic amines, but only those of very strongly basic character, such as piperidine or the quaternary ammonium hydroxides. The sodium salt of the compound is soluble in water to the extent of at least 10%. The pH of this solution is in the range of 11.5 to 12.

Stability.—The meta-thiazane-2,4-dione in crystalline form appears to be indefinitely stable under ordinary conditions. Some difficulty has been experienced in making the solution and keeping the drug in solution. Therefore, it has to be made fresh in each case; however, once a 2.5% solution has been made, it can be diluted 10 times and, in this strength, the drug will remain in solution at least long enough for it to be administered by the intravenous drip method throughout a surgical operation.

COMMENT

For me to enter the field of chemistry may be presumptuous. Nevertheless, the fact that I can read a structural formula and have administered sedative, analgesic, and anesthetic agents to thousands of people once led me to conjecture, from the structural formula of a newly introduced product, that it would be a "short-acting" substance, which it later proved to be. In the structural formula of Dolitrone, I noticed that two double-bonded oxygen atoms are linked, each to a carbon atom that is part of the central heterocyclic ring, and the nearer such double-bonded oxygens are to the nucleus of a compound the better, it seems, are its local analgesic properties. At all events, Dr. F. T. Maher, pharmacologist at the Mayo Foundation, has produced experimental corneal analgesia by topical application to the eye of a rabbit of about a 10% suspension in polyethylene glycol of Dolitrone. It has been suggested that such a suspension may possibly be suitable for intravenous and intramuscular injection. There is some experimental evidence to support this idea, but more must be learned before the suspension can be seriously considered for clinical use. Of course, I do not know all there is to know about Dolitrone. I have an experience of only 112 cases plus the experience that has accumulated since this preliminary report was put together. Thus far, more than any other product, it seems, when combined with other agents, to be a realization of 30 years of effort to produce safe, smooth analgesia by the balanced use of various agents.

ADDENDUM

Since this paper was written, the series has grown to 315 and the manufacturer has improved Dolitrone. When the previous drug was used, unwanted reactions were extremely rare, none was fatal, and any generalized untoward reactions may have been attributable to something other than what the patient received by injection. When the improved preparation has been used, I have seen no untoward reactions thus far.

Industrial Fatigue.—The unmeasurable factors which cause stress and fatigue in industry, such as emotional stimuli, boredom, social adjustment, etc., are certainly more numerous than those which can be measured. In spite of our ignorance of the quantitative importance of these imponderables, certain physical factors which lead to fatigue have been measured and their importance evaluated. As a result we know that industrial fatigue can be reduced. *First,* the environmental conditions can be improved to the best possible level. *Second,* machines and tools can be designed for maximum efficiency with minimum physiological stress. *Third,* the workers can be chosen on the basis of their physiological fitness for the given job and their work can be organized to produce minimal fatigue. The accomplishment of these objectives requires the collaboration of the physiologist, the engineer, management, and labor. Such a cooperative endeavor has . . . resulted in improving the working conditions in numerous jobs, thus reducing fatigue and creating higher efficiency and morale. . . .—Lucien Brouha, M.D., D.Sc., Fatigue—Measurement and Reduction, *Industrial Medicine and Surgery,* December, 1953.

CLINICAL NOTES

PHEOCHROMOCYTOMA MASQUERADING AS PREECLAMPSIA

Capt. Leon Wallace
and
Lieut. John D. McCrary, (MC), U. S. Army

This report is of interest because it is the 13th instance of a pheochromocytoma associated with pregnancy that we have found in American and British literature.[1] Although rare, this condition is of great importance because it is potentially curable and has been frequently incorrectly diagnosed. Pheochromocytomas are tumors of the adrenal medulla that may give rise to a clinical picture presenting several or all of the following symptoms: hypertension, headache, sweating, nausea and vomiting, palpitation, cardiac arrhythmias, epigastric pain, dyspnea and tachypnea, glycosuria, pulmonary edema, or shock. The hypertension may be constant or paroxysmal. Because of this picture, pheochromocytomas have masqueraded under the diagnoses of malignant hypertension, neurosis, brain tumor, and, as in our case, preeclampsia.

REPORT OF A CASE

This patient, a retired, white, army nurse, was in excellent health until the latter part of her first pregnancy in March, 1947, at which time she was 27 years old. Because of an elevated blood pressure up to 180 mm. Hg, ankle edema, and albuminuria, she was presumed to have preeclampsia, and on this basis labor was induced and she delivered in her eighth month of pregnancy of a 7 lb. (3,175.1 gm.) baby, without postpartum complications. Blood pressure and urine were normal post partum. After this pregnancy she noted that she perspired profusely, a condition that had not occurred before.

Second Pregnancy.—The patient's last menses before the second pregnancy began on Jan. 11, 1948. Blood pressure was normal until September, when it rose from the original 120/80 to 160/100 mm. Hg. On three occasions during this pregnancy the urinary sugar was 1 to 4 +. No vomiting occurred, moderate ankle edema was first noted in September, and no albumin was found until September, when a trace was recorded. She was delivered, without complications, of a 6.5 lb. (2,948.5 gm.) baby in September, 1948.

Third Pregnancy.—The patient's last menses before the third pregnancy was July 1, 1949; she was first seen by her obstetrician in September, at which time her blood pressure was 150/100 mm. Hg. This then went down to 130/90-80 mm. Hg until March, 1950, when it began to climb up to 200/160 mm. Hg. One plus albuminuria appeared for the first time two weeks prior to delivery. Glycosuria was 4 +- in January and February, 1950, but at no other time. No ankle edema was noted at any time. On April 2, 1950, a 9 lb. 2 oz. (4,138.4 gm.) baby was delivered uneventfully. Six weeks post partum the blood pressure was 160/100 mm. Hg; five and a half months post partum it was 190/120 mm. Hg.

Fourth Pregnancy.—On July 13, 1950, her period was two weeks overdue. Blood pressure was 160/100 mm. Hg. After medical consultation dilation and curettage were performed.

Interim.—The patient was hospitalized at the Veterans Administration Hospital, Altoona, Pa., in January, 1951, and following is a summary of the hospital admission. A 30-year-old woman entered the hospital with chief complaints of occipital headaches, tenseness, and excessive perspiration for the past six weeks. During the summer of 1950 she had a routine examination, at which time the blood pressure was found to be elevated. Six months ago occipital and throbbing headaches developed. At this time she also noted tenseness and marked perspiration. She is of the opinion that her maternal responsibilities as well as her husband's assignment to Korea aggravated these symptoms. No dizziness or blurring of vision were noted at this time. Urine was normal in color. There was no dysuria, nocturia, or history of rheumatic fever or nephritis. Physical examination showed that the patient appeared in fairly good health. She was moderately tense. Blood pressure was 204/112 mm. Hg, pulse rate was 76 beats per minute, and temperature was 98 F (36.7 C). Fundi revealed arteriolar attenuation. There was no definite arteriovenous nicking. A systolic murmur grade 3 was noted in the fourth interspace to the left of the sternal margin with a snapping A-2. Regular sinus rhythm was present.

A roentgenogram of the chest was normal. An intravenous pyelogram was normal. Retrograde pyelogram was normal, and the white blood cell count was 10,400 per cubic millimeter, neutrophils 57%, lymphocytes 36%, monocytes 1%, and eosinophils 6%. The red blood cell count was 4,750 per cubic millimeter; hemoglobin level was 14 gm. per 100 cc.; urea, 10.5 mg. per 100 cc.; protein, 7.0 gm. per 100 cc.; albumin, 4.7 gm. per 100 cc.; globulin, 2.3 gm. per 100 cc.; Kahn, negative; Fishberg concentration, first specimen showed 1.021. On catheterization most of the phenolsulfonphthalein showed 1 to 2 + albumin and few to many red and white blood cells. Bladder specimen on retrograde pyelogram was normal, except for occasional white blood cells. Specimen of left and right ureter showed many red and white blood cells. Cultures from the bladder and ureter were negative. The patient was placed on mild sedation, bed rest, salt-free diet, and erythrityl (Erythrol) tetranitrate. The patient, while on the ward, continued to have a moderately elevated diastolic blood pressure that varied anywhere from 92 to 120 mm. Hg, with the average at about 110 mm. Hg. The systolic blood pressure ranged from 130 to 190 mm. Hg, with an average of 150 mm. Hg. The patient was given amobarbital (Amytal) sodium, and at one reading the blood pressure dropped to 136/90 mm. Hg. The patient, while on the ward, was mildly agitated at times. Apparently outside events including her husband's tour in Korea manifested itself by moderate anxiety. Despite the medication and bed rest, the patient's blood pressure remained relatively constant. Her symptoms, however, decreased somewhat. Sweating and occipital headaches decreased to a moderate degree. She still had episodes of tenseness that were correlated with external events. Because of the preeclamptic episodes and urinary findings, it was believed that the patient probably had a chronic glomerulonephritis, which accounted, in part, for her hypertension.

A summary of the findings was made at Walter Reed Army Hospital on Sept. 5, 1952. The patient was admitted to the

From the general medicine section (Dr. Wallace) and the obstetrics-gynecology section (Dr. McCrary), U. S. Army Hospital, Fort McClellan, Ala. Dr. Wallace is now in the process of entering private practice in Los Angeles, and Dr. McCrary is in the process of entering private practice in Omaha.

1. (a) Crowther, K. V.: Two Cases of Phaeochromocytoma, Brit. M. J. **1**: 445-448, 1951. (*b*) Kelly, H. M.; Piper, M. C.; Wilder, R. M., and Walters, W.: Case of Paroxysmal Hypertension with Paraganglioma of the Right Suprarenal Gland, Proc. Staff Meet., Mayo Clinic **11**: 65-70, 1936. (*c*) Burgess, A. M.; Waterman, G. W., and Cutts, F. B.: Adrenal Sympathetic Syndrome with Unusual Variations in Cardiac Rhythm: Report of Case, Arch. Int. Med. **58**: 433-447 (Sept.) 1936. (*d*) Palmer, R. S., and Castleman, B.: Paraganglioma (Chromaffinoma, Pheochromocytoma) of the Adrenal Gland Simulating Malignant Hypertension: Report of Case, New England J. Med. **219**: 783-796, 1938. (*e*) Bartels, E. C., and Kingsley, J. W., Jr.: Diagnostic Approach to Pheochromyctoma: Report of Case, Lahey Clin. Bull. **6**: 7-12, 1948. (*f*) Bowen, G. L.; Grandin, D. J.; Julien, E. E., and Krech, S., Jr.: Pheochromocytoma Complicating Pregnancy, Am. J. Obst. & Gynec. **59**: 378-383, 1950. (*g*) Hunt, A. B., and McConahey, W. M.: Pregnancy Associated with Diseases of the Adrenal Glands, ibid. **66**: 970-987, 1953. (*h*) Sayer, W. J.; Moser, M., and Mattingly, T. W.: Pheochromocytoma and Abnormal Electrocardiogram, Am. Heart J. **48**: 42-53, 1954. (*i*) Gerwig, W. H., Jr., and Seeley, S. F.: Pheochromocytoma, South. M. J. **46**: 355-358, 1953. (*j*) Becker, M. C.; Bass, R. D., and Robbins, C. M.: Pheochromocytoma: A Cause of Post-Partum Convulsions, J. M. Soc. New Jersey **46**: 339-342, 1949. (*k*) Calkins, E., and Howard, J. E.: Bilateral Familial Phaeochromocytomata with Paroxysmal Hypertension: Successful Surgical Removal of Tumors in 2 Cases, with Discussion of Certain Diagnostic Procedures and Physiological Considerations, J. Clin. Endocrinol. **7**: 475-492, 1947. (*l*) Rothermich, N. O.: An Unusual Case of Pheochromocytoma with Fatal Outcome, Ann. Int. Med. **36**: 157-165, 1954.

hospital on June 24, 1952, at which time she noted that the symptoms had become worse after her discharge from the hospital for the previous work-up in January, 1951. Her headaches increased in frequency and severity; she had taken nothing stronger than aspirin and had some relief from applying an ice bag to her head. The headaches usually lasted one full day occurring as often as four times per week but more recently about once a week. They were preceded by an aura of feeling of dulness in her faculties, and she usually felt rather tired and dull after the headaches were gone. They were severe in intensity and prevented her from doing any activity while she had them. They were frequently accompanied by profuse diaphoresis. Recently she had noted some nausea not necessarily related to the headaches. She had not had blurring of vision or photophobia with the headaches. She denied any genitourinary disease prior to the pregnancies. She had scarlet fever as a child but denied acute or chronic glomerulonephritis by name or symptoms. She had nocturia one or two times but no day frequency and had no hematuria or pyuria. On Jan. 1, 1951, she had a single episode of what was diagnosed as angina but had had no similar attacks before or since. Electrocardiograms in the past were said to be normal, although one taken about two months ago was reported to show left ventricular hypertrophy. She was admitted to the United States Army Hospital, Fort McClellan, Ala., in April, 1952, where the following observations were made: urine concentration on an overnight specimen, 1.012; phenolsulfonphthalein, 48%, two hours; and blood urea nitrogen, normal. Eyegrounds showed extreme narrowing of arterioles. She was transferred to Walter Reed Army Hospital for possible medical treatment for hypertension.

Physical Examination.—Physical examination revealed a well-developed, well-nourished woman who appeared moderately acutely ill. She complained of severe generalized headache and feeling of mental dulness and inability to concentrate. Slight ptosis of eyelids was noted. She was cooperative and intelligent. Her weight was 125 lb. (11.3 kg.), and the blood pressure was 180/120 mm. Hg. Fundi revealed grade 4 hypertensive retinopathy in the left eye and early papilledema in the right. Ears, nose, throat, breasts, and lungs were normal. A grade 1 systolic murmur was heard along the left sternal border. The heart tones were of good quality, and there was a normal sinus rhythm. The abdomen and peripheral pulses were normal. No peripheral edema was observed. The skin was moist, and the reflexes were physiological.

Laboratory Findings.—The laboratory findings revealed a specific gravity of 1.020 on urinalysis. Urine culture revealed Micrococcus tetragenus, which probably was a contaminant, and an occasional white blood cell. Subsequent catheterized urine specimen revealed Escherichia coli and Streptococcus faecalis. Numerous urinalyses did not reveal any trace of albumin. Three-plus glycosuria was noted on one occasion prior to surgery. Total eosinophil count prior to surgery was 25 per cubic millimeter and after surgery 438 per cubic millimeter. Blood urea nitrogen was 19.6 mg. per 100 cc., urea clearance was 75%; urine concentration test, 1.020; 24-hour urine sodium, 6.25 mg. per 100 cc.; potassium, 37 mEq. per liter; and phenolsulfonphthalein, 50% in 15 minutes on one occasion and 39% in 15 minutes on a subsequent test. The white blood cell count and differential were normal. Prior to surgery fasting blood sugar level was 130, 140, and 153 mg. per 100 cc., and after surgery it was 96 mg. per 100 cc. two hours after eating and then 77 mg. per 100 cc. Hematocrit and sedimentation rate were normal. Bleeding time and clotting time were normal. Basal metabolic rate prior to surgery was + 60%, and after surgery it was — 25%. Total cholesterol was 218 mg. per 100 cc. after surgery. Pheochromocytoma of adrenals was the pathological report. Posteroanterior and left lateral chest films and an excretory urogram were normal. Electrocardiograms were abnormal. Tracings from June 30, 1952, to Aug. 26, 1952, revealed abnormal S-T and T-wave changes compatible with myocardial ischemia secondary to coronary insufficiency. Tracings showed varying degrees of myocardial ischemia; however, the last tracing showed improvement over a tracing taken prior to surgery.

Consultations.—A gastrourinary consultation was obtained, and exploration for pheochromocytoma was recommended.

Hospital Course.—Prior to therapy the patient's daily blood pressure averaged about 180/110 mm. Hg, but after the intravenous administration of 40 mg. of hexamethonium on July 15, 1952, the blood pressure fell from 180/136 to 90/60 mm. Hg while the patient was sitting; supine, it fell from 208/134 to 130/90 mm. Hg; however, the patient's pressure subsequently rose to 270/166 mm. Hg in the supine position. This response was suggestive of pheochromocytoma. The patient was subsequently given 15 mg. of piperoxan hydrochloride, and the blood pressure fell from 200/130 to 100/70 mm. Hg within five minutes. The simultaneous electrocardiogram revealed change from negative to upright T waves in all leads. Subsequently the patient was given Dibenzyline (N-phenoxyisopropyl-N-benzyl-β-chloroethylamine hydrochloride) intravenously. The blood pressure fell from 200/130 to 90/70 mm. Hg and remained lower than 140/90 mm. Hg for 18 hours. This response was characteristic of pheochromocytoma. On July 31 the blood pressure was 150/100 mm. Hg 20 hours after an injection of Dibenzyline. The patient was then given 0.25 mg. of histamine intravenously, and the blood pressure rose to 200/130 mm. Hg, which was a positive response for pheochromocytoma. In preparation for surgery the patient was subsequently placed on Dibenzyline therapy, 10 mg. orally four times daily. While the patient received this drug her blood pressure was initially 126/92 mm. Hg when she sat and 114/92 mm. Hg when she stood. After a few days on this therapy, the blood pressure average was 130/94 mm. Hg with 150/100 mm. Hg supine, and decreased sweating was noted. The fundi remained unchanged. Dibenzyline therapy was discontinued one day prior to surgery. On Aug. 19, 1952, the left pheochromocytoma was removed surgically. During palpation of the left side, blood pressure rise was noted within five minutes. After removal of the tumor the blood pressure fell to zero and remained there for about 30 seconds until levarterenol (Levophed) bitartrate was given. Four milligrams in 1,000 cc. of 5% dextrose was injected. Initially a rapid drip was necessary to obtain a blood pressure response. Administration of levarterenol was then continued at a rate of 15 to 20 drops per minute, and the blood pressure was stabilized at 100/70 mm. Hg. About seven hours after surgery, this was gradually discontinued, and the blood pressure remained stabilized at about 100/70 mm. Hg. The first few days after surgery the patient's blood pressure averaged 120/70 mm. Hg. One day it was 180/120 mm. Hg. The patient's blood pressure subsequently stabilized at about 136/90 mm. Hg, and prior to discharge it was 126/86 mm. Hg. Gradual improvement in the funduscopic changes were noted. There was a progressive decrease in arteriolar spasm and a clearing of retinal edema and old hemorrhages. The patient had no recurrences of headaches after surgery and was asymptomatic at the time of discharge. Laboratory studies prior to surgery revealed glycosuria, elevated blood sugar level, eosinopenia, and abnormally increased basal metabolic rate. After surgery these tests were within normal limits. Assay of the pheochromocytoma revealed 5.4 mg. of arterenol (Nor-Adrenalin) per gram of tissue and 0.16 mg. of epinephrine (Adrenalin) per gram of tumor tissue.

Fifth Pregnancy.—(At United States Army Hospital, Fort McClellan, Ala.) The last menstrual period before the fifth pregnancy was Sept. 10, 1952. A spontaneous abortion occurred on Dec. 2, 1952. At that time the patient appeared in excellent health. The blood pressure was 100/50 mm. Hg.

Sixth Pregnancy.—(At United States Army Hospital, Fort McClellan.) The sixth pregnancy was entirely normal, and the patient delivered a normal child on March 5, 1954. At no time during the pregnancy was there any albuminuria, ankle edema, or elevated blood pressure. Blood pressure averaged 120/80 mm. Hg. She is well, and the electrocardiogram is normal.

COMMENT

This report presents the only recorded instance in which three successful pregnancies were carried through in the presence of a pheochromocytoma. The relationship between pregnancy and the symptoms and signs of pheochromocytoma are of interest. In the 13 recorded cases the suggestive clinical picture of pheochromocytomas was first noted during pregnancy in 7 instances.[2]

In two cases there appeared to be no relationship.[3] In four other cases,[4] although the onset of symptoms preceded the pregnancy, they recurred or became more marked during pregnancy. Therefore, in 11 of the 13 cases the clinical picture associated with pheochromocytoma either had its onset or became enhanced during pregnancy. The possible hormonal mechanism is not clear at this time.

In the case presented in this paper, the patient gave birth to three normal children, had a therapeutic termination of pregnancy by dilation and curettage three months after her third delivery, and had a spontaneous abortion four months after the removal of the pheochromocytoma. Less than two years after this surgery, she had an uneventful pregnancy with the delivery of a normal child. In only one other case report was there mention of a successful pregnancy after the removal of the tumor.[1g] Up to this time, the 12 patients with pheochromocytomas who had 19 pregnancies and deliveries showed the following record: 2 mothers died of shock early in the postpartum period, and the fetal loss after the period of viability was 9 out of 19. The diagnosis in the two fatal cases was not made until autopsy.

The confusion with preeclampsia was undoubtedly due to the combination of hypertension, albuminuria, and ankle edema, which appeared in the eighth month of the first pregnancy and in the latter part of the second pregnancy. It is noteworthy that the albuminuria and ankle edema were never marked, and during the third pregnancy no ankle edema was noted. Another point of interest was the intermittent glycosuria that appeared in the second and third pregnancies. This has been frequently noted with pheochromocytomas, and that the tumor was the cause was borne out by the elevated fasting blood sugar levels prior to surgery and the normal result after surgery. The fact that the hypertension persisted after her third delivery and that her chief complaints were headaches, excessive perspiration, and tenseness led to the suspicion of the true nature of the underlying disorder only after she incorrectly was thought to have chronic glomerulonephritis and had had her fourth pregnancy interrupted. The electrocardiographic findings were of interest but will not be elaborated on here, because this and other aspects have been the subject of other papers.[5] Presently for testing purposes, if the blood pressure is elevated piperoxan hydrochloride and phentolamine (Regitine) methanesulfonate are used and, if the blood pressure is normal between paroxysms, histamine is used. Although other drugs have been tested, these currently appear to be the most frequently used and the most reliable.

This case points to the advisability of keeping in mind a diagnosis of pheochromocytoma if the clinical picture suggestive of preeclampsia is presented. Others [6] have shown that the tests for pheochromocytoma in preeclampsia with its associated hypertension are reliably negative when the tumor is not present. The excellent results after successful surgical removal of the tumor are gratifying and most favorably alters the patient prognosis.

SUMMARY

This 13th recorded case of pheochromocytoma occuring in the presence of pregnancy is the first instance in which three normal pregnancies occurred in the presence of this tumor. The symptomatology was suggestive of preeclampsia and masqueraded under this diagnosis. There was a possible relationship between the pregnancy and the activity of a pheochromocytoma. The importance of discovering the presence of a pheochromocytoma is emphasized since its removal can lead to a "cure."

ADDENDUM

Dr. William Peelen [7] has revealed that he had an additional case in his private practice and that he was able to find six additional cases in the foreign literature. His findings will be the subject of a future publication.

6423 Wilshire Blvd. (48) (Dr. Wallace).

2. Footnotes 1*a*, 1*e*, 1*f*, 1*h*, 1*i*, and 1*j*.
3. Footnotes 1*b* and 1*d*.
4. Footnotes 1*c*, 1*g*, 1*k*, and 1*l*.
5. Footnotes 1*h* and 1*i*.
6. Assali, N. S., and Prystowsky, H.: The Effect of Adrenergic Blockade with a Benzodioxane Derivative, 933F, on Hypertension of Toxemia of Pregnancy, Surg., Gynec. & Obst. **90**: 655-658, 1950.
7. Peelen, J. W.: Personal communication to the authors.

GROSS HEMATURIA AS THE PRESENTING SYMPTOM OF INFECTIOUS MONONUCLEOSIS

David C. Lindsey, M.D.
and
William P. Chrisman Jr., M.D., Temple, Texas

Gross hematuria is a rare and unusual clinical finding in patients with infectious mononucleosis; however, the renal tract may be involved in the course of this disease. Tidy and Morley [1] reported an incident of renal involvement in 6% of 270 cases analyzed in 1921. Wechsler [2] noted abnormal urinary findings in 3% of 556 cases observed during an Army epidemic. This 3% included patients with red and white blood cells, albumin, hyaline, and granular casts in the urine and included two cases of gross hematuria. Thompson and Pitt [3] reported a case of infectious mononucleosis with gross hematuria occurring in an 18-year-old college girl. However, many series of cases reported in the literature over a period of years either make no mention of renal findings or stated that none were noted. This case of a patient with infectious mononucleosis is presented to emphasize that gross hematuria may be an outstanding feature, since this is not a frequent or generally recognized complication.

REPORT OF A CASE

A 33-year-old Mexican man entered the hospital on March 11, 1954. He stated that about Feb. 18, 1954, he became ill with muscular aching, low back pain, frontal headache, mild sore throat, soreness beneath the jaws, and fever. Three days later he noted swelling of his face and hands; a very important finding was that his urine was grossly bloody, which the patient himself could not help but notice. The hematuria persisted for two days, at which time he consulted his physician because, in

From the Veterans Administration Center.

1. Tidy, H. L., and Morley, E. B.: Glandular Fever, Brit. M. J. **1**:452 (March) 1921.
2. Wechsler, H. F.; Rosenblum, A. H., and Sills, C. T.: Infectious Mononucleosis: Report of Epidemic in Army Post, Ann. Int. Med. **25**: 113 (July) 1946; 236 (Aug.) 1946.
3. Thompson, W. T., Jr., and Pitt, C.: Frank Hematuria as a Manifestation of Infectious Mononucleosis, Ann. Int. Med. **33**:1274 (Nov.) 1950.

addition to the hematuria, there was no cessation in the muscular aching, low back pain, and headache. He was informed by his physician that he had some type of kidney disease and hypertension and was advised to enter the hospital. During the 15 day interval prior to admission to the hospital, gross hematuria did not recur.

Past medical and surgical history revealed jaundice in 1943, while the patient was in the South Pacific; otherwise, it was noncontributory. Physical examination revealed a moderately obese male, temperature was 98.6 F, and blood pressure was 145/100 mm. Hg. Examination of the cardiovascular system revealed no gross abnormalities. There was moderate injection of the pharynx, soft tissue swelling, and slight tenderness in both submandibular areas, but no definite adenopathy. No pedal or supraorbital edema was present. Mild costovertebral angle tenderness on the left side was elicited. The remainder of the examination was normal. A roentgenogram of the chest and an electrocardiogram were reported as within normal limits. Laboratory studies on admission showed that the hemoglobin level was 14.2 gm. per 100 cc., the white blood cell count was 7,250 per cubic millimeter, and the differential count was: polynuclear neutrophils 64%, lymphocytes 32%, eosinophils 3%, and basophils 1%. Blood serology was negative. Urinalysis showed specific gravity 1.020, 1+ albumin, 6 to 8 pus cells and rare red blood cells. Blood urea nitrogen was 18 mg. per 100 cc. Creatinine was 1.6 mg. per 100 cc. Agglutinations for Brucella, tularemia, Proteus X19, and Salmonella typhosa O and H were negative. Heterophil antibody reaction was positive in titers of 1:224 and 1:448 before guinea pig kidney absorption [4] and 1:56 and 1:112 after absorption.[5] Urinalysis on the fifth hospital day showed 1+ albumin and innumerable red blood cells, but on the following days the red blood cells were reduced gradually, and on the 12th day there were only three to five red blood cells and no albumin. On the 14th hospital day, there were no red blood cells in the urine. Blood urea nitrogen on repeated determinations was 18, 19, and 16 mg. per 100 cc. respectively. Peripheral blood smears for atypical lymphocytes were positive on the 12th hospital day, and the white blood cell count showed a progressive lymphocytosis [4] until the 18th day, at which time the lymphocytes totaled 56% of the total white blood cell count.

Hospital Course.—The patient was afebrile, and the only complaint was that of aching in the low back, legs, and shoulders, which was relieved by an occasional dose of aspirin. The blood pressure was 120/80 mm. Hg on the fourth hospital day. Intravenous pyelograms were normal. No dysuria, oliguria, or anuria occurred. The patient was asymptomatic on the 10th hospital day. At this time there was no evidence of impaired renal function, as shown by urine concentration and phenolsulfonphthalein excretion tests, and there was also no elevation of the blood urea nitrogen. The patient was permitted to go home, with instructions to return for further examination in regard to renal disease.

SUMMARY AND CONCLUSIONS

Gross hematuria may be an outstanding feature in the clinical course of infectious mononucleosis. It is possible to confuse this condition with acute glomerulonephritis. The difference is shown in that the abnormal urinary findings and elevation of blood pressure persist over a far greater period of time in acute glomerulonephritis. The blood urea nitrogen is usually elevated, and some degree of oliguria and anuria does accompany glomerulonephritis but is absent in infectious mononucleosis. Differentiation of the two diseases is important insofar as economic reasons to the patient are concerned. Glomerulonephritis requires a longer convalescent interval and carries a guarded prognosis at best, whereas, in infectious mononucleosis the prognosis is good and convalescence is shorter.

4. Hoagland, R. J.: Infectious Mononucleosis, Am. J. Med. **13**: 158 (Aug.) 1952.

5. Leibowitz, S: Infectious Mononucleosis: The Value of Differential Absorption Tests in Its Serologic Diagnoses, Am. J. Med. **13**: 172 (Aug.) 1952.

COUNCIL ON PHYSICAL MEDICINE AND REHABILITATION

REPORT OF THE COUNCIL

The Council has authorized publication of the following article.

RALPH E. DE FOREST, M.D., *Secretary.*

ULTRASONIC ENERGY FOR THERAPEUTIC PURPOSES

Since 1952, when the Council on Physical Medicine and Rehabilitation presented its report on the status of ultrasonic energy in physical medicine,[1] an increasing number of reports on the clinical use of this physical agent have appeared. Because of the general interest that these reports have aroused among physicians, the Council is providing this additional statement to the members of the medical profession.

Ultrasound used currently for therapeutic purposes consists of mechanical vibrations with frequencies ranging approximately from 700,000 to 1 million cps. Such vibrations are produced by a piezo-electric crystal mounted in an applicator, designed to facilitate the administration of the ultrasound to the subject. The piezo-electric crystal converts oscillating electrical current supplied from a generator into mechanical vibrations. Unlike electromagnetic radiation, ultrasonic waves of the aforementioned frequencies and at intensities used in therapy do not pass through air or a vacuum but require a material medium for their transmission.

ACTIONS

Although sufficient basic information is lacking regarding the action of ultrasonic energy on tissues when applied in safe therapeutic dosages, it is believed from the evidence now available that the chief physiological effect of ultrasound is a thermal one. Even though there may be no significant rise in temperature recorded and no significant increase in warmth perceived by the patient in the area exposed to safe levels of ultrasonic energy, localized temperature rises within the tissue have been recorded. This heating occurs more readily at interfaces formed by the junction of tissues of different densities, such as muscle-bone and muscle-tendon or muscle-fascia junctions.

USES

The use of ultrasonic energy in therapy should not be considered as specific treatment for any disease. If applied properly and safely, it may be a useful adjunct in producing relief from such symptoms as pain, soreness, and tenderness associated with (1) nonspecific types of bursitis, periarthritis, fibrositis, tenosynovitis, myofascitis, and myositis; (2) rheumatoid arthritis and osteoarthritis; and (3) nonparalytic forms of neuritis such as sciatic and brachial neuralgia and painful neuromas of the stump after amputation. The use of ultrasound has been reported for the treatment of localized cutaneous infections, chronic cutaneous ulcerations, and as an adjunct in hastening the absorption of medicaments intended for administration by inunction in occlusive peripheral vascular disease (even though applied proximally to the lesion). Since these applications are as yet quite controversial, in the opinion of the Council they should not be listed at this time as uses for this physical agent.

CONTRAINDICATIONS

The application of ultrasound for therapeutic purposes is contraindicated in and about the brain, spinal cord, eye, ear, accessory nasal sinuses, heart, reproductive organs, epiphysis of growing bone, and the large autonomic structures such as the celiac,

1. Present Status of Use of Ultrasonic Energy in Physical Medicine, report of the Council on Physical Medicine and Rehabilitation, J. A. M. A. **148**: 646-651 (Feb. 23) 1952.

mesenteric, pudendal, and aortic ganglion plexuses. Ultrasound should not be applied to areas of the body in which an acute infectious process, a malignant lesion, inadequate circulation, or impaired sensation exist.

TECHNIQUE OF APPLICATION AND DOSAGE

Ultrasonic applications are administered by direct contact of the applicator to the area of the skin that has been coated with a coupling medium, usually mineral oil, or by immersing the applicator and the part of the body to be exposed in a water bath, which serves as a coupling medium. When the water bath method is used, there is usually a space of ½ to 2 in. between the applicator and the part of the body being exposed. The distance is affected by the patient's tolerance to ultrasound. A coupling medium is used because the air between the applicator and the subject will impair the transmission of ultrasound (ultrasonic waves of the frequencies and intensities mentioned previously do not pass through air).

When the applicator is applied directly to the skin, the usual practice is to move the applicator slowly back and forth across the area being exposed. If the applicator is held in a stationary position, heat production is greatly intensified in a local area beneath the applicator, and a painful sensation can result. Since excessive amounts of ultrasound can be destructive to tissues,[1] and since pain indicates that an excessive amount of ultrasound has been applied, the production of pain during an ultrasonic application should be avoided.

The output of the ultrasonic generator may be indicated by a meter on the instrument or by placing the applicator in a device designed especially to measure ultrasonic output (depending on the type of apparatus used). Low dosages range from 0.5 to 1.5 watts per square centimeter; medium dosages lie in the range from 1.5 to 3 watts per square centimeter, and large dosages range from 3 to 6 watts per square centimeter. These levels apply to instruments in which applicators have an effective ultrasonic radiating area of not more than 10 square centimeters. These figures do not necessarily indicate the actual energy absorbed by the tissues but represent the output of the machine. They serve then as only relative guides to dosage in therapy. In all instances, one must rely on the sensation felt by the patient and keep the dosages within comfortable tolerances in order to avoid pain or the sensation of excessive heat. The length of exposure at present is somewhat empirical, although times vary from 3 to 10 minutes, depending on the intensity employed and the area to be treated. Treatments are usually given daily or on alternate days.

The following article has been adopted for publication by the Council on Physical Medicine and Rehabilitation of the American Medical Association and approved by the Committee on Conservation of Hearing of the American Academy of Ophthalmology and Otolaryngology.

RALPH E. DE FOREST, M.D.
Secretary of the Council.

DEAN M. LIERLE, M.D., *Chairman,*
Committee on Conservation of Hearing.

PRINCIPLES FOR EVALUATING HEARING LOSS

INTRODUCTION

A method more satisfactory than those now in use is needed to evaluate hearing losses in terms of the disability that they produce. With a pure tone audiometer, the hearing loss itself can be measured in decibels for tones of different frequency, but this measurement does not denote the degree of disability. Several methods have been proposed for calculating the percentage loss of hearing from the pure tone audiogram, but none of them has proved entirely satisfactory.

The first of these, the so-called 0.8 method,[1] was not intended to be a measure of economic disability. It yielded a "percentage hearing loss," useful as a descriptive medical term. In this method, and also in the method recommended in 1942 and modified in 1947 by the American Medical Association,[2] the basis of calculation is restricted to the "speech frequencies." In the so-called A. M. A. method,[2] the four test frequencies were weighted differently and greater importance was assigned to the loss of a given number of decibels in the middle of the intensity range than to corresponding losses for either very weak or very strong sounds. The weightings were adjusted in an effort to bring the results into harmony with judgments of the amount of disability that seemed to be associated with the various hearing losses. Actually the A. M. A. method is fairly satisfactory for calculating percentage capacity to hear speech for persons who have conductive hearing losses in which the losses are not very different for different frequencies. For persons with nerve deafness, however, and particularly for those in whom hearing for low and middle tones is good but the hearing for high tones is poor, the results often are in conflict with the clinical evidence.

The most valid way to measure the ability to hear speech correctly is to use words or sentences. Hearing and recognizing the spoken word is more than receiving a set of independent signals; it is a dynamic process in which time is a factor and in which there are complicated interactions. It seems logical to use speech as the material in a test of the ability to hear speech. The recent development of speech audiometers may make it practical to do so. The unaided human voice, as used in the conventional "spoken voice test" and the "whisper test," is not sufficiently accurate and is confined to too narrow a range of intensity.

Specifications for speech audiometers have been compiled.[3] Lists of words and sentences for standard test material must now be selected and satisfactory recordings made of them. Methods for their use must be standardized, and rules for calculating the disability of hearing must be established. This report is intended as a first step in this task.

The next step will be to apply the proposed method to persons who have hearing losses of various types and whose hearing disability has been estimated directly by competent and experienced observers. The disability caused by hearing loss for these individuals will be calculated from the results of speech audiometry according to tentative rules and tables, which will be adjusted until reasonable and consistent agreement is obtained. These findings will be related to tests with pure tone audiometers and other hearing tests. The proposed method should not attempt to determine a monetary value of disability for total loss of hearing, either for one ear alone or for both ears (binaural). The determination of the percentage disability resulting from hearing loss is distinct from the problems of clinical diagnosis of the type of hearing loss and its probable cause.

DEFINITIONS AND PRINCIPLES

The following definitions and statements give a basis for the proposed method.

Hearing for Speech.—For the present purpose, hearing is defined as the ability to identify spoken words or sentences under average everyday conditions of normal living by the sense of hearing, unaided by touch or vision. The proposed method should deal with the function of hearing for speech and not with the details of injury to the ear in an anatomic sense. The functional point of view is more realistic than the anatomic and fairer to all concerned. The ability to hear very high or very low tones contributes little to the intelligibility of speech. Injury to the sense organ or the nerves that detect the highest audible tones may be real in a medical or pathological sense but usually does not cause a disability of economic or social importance. The tests of hearing to be recommended should give a measure, directly or indirectly, of the ability to hear correctly simple statements, commands, or questions. The ability to repeat correctly or to respond appropriately to the sentences, questions,

1. Fletcher, H.: Speech and Hearing, New York, D. Van Nostrand Company, Inc., 1929.

2. Tentative Standard Procedure for Evaluating the Percentage Loss of Hearing in Medicolegal Cases, report of the Council on Physical Medicine, J. A. M. A. **133**: 396-397 (Feb. 8) 1947.

3. Standards of the American Standards Association, Audiometers for General Diagnostic Purposes, Standard Z24.5-1951, New York, American Standards Association, 1951. Standards of the American Standards Association, Specifications for Speech Audiometers, Standard Z24.13-1953, New York, American Standards Association, 1953.

or commands should be taken as evidence of correct hearing. In other words, the rules and schedules for calculating the percentage disability of hearing from the results of the particular tests should be validated in terms of sentence intelligibility.

Benefits Derived from Hearing Aids and Auditory Training.—The probability that a particular type or degree of hearing loss may or may not be benefited by a hearing aid should not be considered in calculating the disability caused by a hearing loss. This follows from the broad principle, which is widely accepted, that a loss of normal function should be evaluated in the absence of any prosthetic device. The proposed schedule of percentages should not consider the possible improvement in hearing for speech that often results from the kind of prolonged training and practice known as auditory training. The percentages of disability to be given in the schedule should therefore be the average expectations for persons of average intelligence, who originally had normal hearing, but without benefit of either a hearing aid or formal auditory training. The proposed method should not give special consideration or any unusual importance to a person's sense of hearing because of the nature of his profession or employment. In very noisy surroundings, for example, it may be difficult or impossible to communicate by speech even if the hearing of the person is normal. Furthermore, an impairment of hearing may reduce the employee's potentiality for changing his job. Everyday communication therefore should be the basis for evaluation of the disability of hearing.

Limits of Normal Hearing and of Total Disability.—In the Minimal Requirements for Pure Tone Audiometers for Diagnostic Purposes, formerly issued by the Council on Physical Medicine and Rehabilitation, the normal threshold of hearing for pure tones is defined for audiometric purposes as "the modal value of the minimum sound pressure, at the entrance to the external auditory canal, which at that frequency produces a sensation of pitch in a large number of apparently normal hearing ears of persons in the age group from 18 to 30 years, inclusive." The average normal threshold for speech can be defined in the same way as the modal or commonest value of the threshold, once a sample of everyday speech has been chosen for reference. A full definition of normal threshold, either for pure tones or for speech, requires also a statement of the limits of normal. This concept is well established in statistical procedures as well as in medical thinking and practice. In clinical audiometry, for example, it is generally accepted that a hearing loss of 15 db. for pure tones may be within the limits of normal variability. A greater loss than this can be considered abnormal. Also, it is at about this level that the hearing loss usually begins to be noticed by the person. In other words, hearing losses within the limits of normal are usually unnoticed and do not cause any practical handicap. The limit of normal for the hearing of speech may reasonably be assumed for the present to be comparable to that for the hearing of pure tones in the speech-frequency range, but it should be defined more precisely in the future when more measurements and better validation become available.

At the other extreme of the hearing range, there may be a total loss of hearing or a total inability to hear speech. As commonly used, these terms are not precise nor necessarily synonymous. It is important to define them and to determine the relation between them. This cannot be done until more experimental data are available.

The concepts of limit of normal hearing and of total inability to hear speech are fundamental. It should be possible to specify both limits in precise objective terms. When they have been established, they will constitute anchor points from which intermediate degrees of disability can be derived.

Binaural Evaluation.—Measurements should be made of the hearing of each ear separately. A rule should be established for computing from these measurements the percentage of the total hearing disability when both ears are used.

Detection of Psychological Factors and Malingering.—It is assumed that the individual is cooperative in the tests of his hearing and that the examiner is satisfied that the individual has understood the tests and responded honestly to them. Part of the responsibility of the examiner is to detect any failure of full cooperation or any significant psychological factors that may, in his opinion, invalidate the tests. If full and intelligent cooperation is doubted, a direct estimate of percentage of disability of hearing (in the functional sense) should be made on the basis of the general behavior of the individual (including his behavior during the preliminary interview) and his response to a pure tone audiometer and to special tests designed to detect malingering. In such cases the examiner's opinion should be given weight at least equal to that of any percentage calculated from the results of routine tests.

Alternative Tests for Language Difficulties.—The standardized recorded lists of sentences and words, which will be recommended for use with a speech audiometer, should be suitable for nearly all English-speaking adults who have had the equivalent of a grammar school education. With individuals who have had less schooling or with those who are accustomed only to a strong dialect or to a language other than English, it will be the duty of the examiner to modify the tests according to his best judgment and ability but in keeping with the established principles.

Need for Pure Tone Audiometry.—Pure tone audiometry is essential for determination of the degree and type of hearing loss. The results of the aforementioned experiments may indicate that the percentage of disability can be computed directly from such tests.

Problem of Causal Relation.—A clinical diagnosis of the type of hearing loss must be made in order to determine causal relation. Pure tone audiograms, both by air conduction and by bone conduction, should be part of the diagnostic study. The following propositions illustrate how such studies may help solve, in individual cases, the problem of causal relation.

1. Conductive hearing loss cannot be attributed to prolonged or repeated exposure to noise. Furthermore, a chronic conductive lesion tends to protect the inner ear from injury by such noise.

2. Audiometry at appropriate intervals is required to distinguish temporary from permanent hearing loss. Pure tone audiometry should be employed, as it is a delicate indicator of possible recovery or deterioration.

3. Some loss of sensitivity for high tones is to be expected with advancing age. For the frequency 2,000 cps, this loss on the average amounts to about 5 db. in the sixth decade and 10 db. in the seventh. The losses at 4,000 cps on the average are about 10 and 20 db., respectively, but there are large individual differences. These losses may not be sufficient in themselves to reduce hearing for speech enough to cause a noticeable disability. The type of loss that usually occurs with age is often indistinguishable by present tests from the impairment caused by exposure to noise. In the rules for determining the disability of hearing from the results of pure tone audiometry, an allowance for the hearing loss expected with advancing age should be included.

4. The desirability of a record of the condition of hearing of every employee made at or before the beginning of employment is obvious. Such a record is also desirable if the employee changes his type of work. In such tests a pure tone audiogram by air conduction should be considered the minimum procedure, and, if possible, speech audiometry should also be used. If the pure tone audiogram by air conduction indicates deviation from normal by more than 15 db. for 500, 1,000, or 2,000 cps or 30 db. for 4,000 cps, a complete pure tone audiogram by both air and bone conduction and a complete otological examination should be made and recorded. Such records would protect the interests of both employer and employee.

During the time the Council on Physical Medicine and Rehabilitation conducted an acceptance program, it compiled minimal acceptance requirements for pure tone and speech audiometers. Substantially similar standards are still issued by the American Standards Association.[3] It is assumed that only instruments that conform to these standards will be employed in making the audiometric tests from which the disability of hearing is to be calculated.

THE JOURNAL
OF THE AMERICAN MEDICAL ASSOCIATION
535 N. DEARBORN ST. . . . . CHICAGO 10, ILL.
Editor . . . . . AUSTIN SMITH, M.D.
Associate Editor . . . . . JOHNSON F. HAMMOND, M.D.
Editor for Medical Literature Abstracts . GEORGE HALPERIN, M.D.
Assistant Editor . . . . . WAYNE G. BRANDSTADT, M.D.

Subscription price . . Fifteen dollars per annum in advance
Cable Address . . . . . "Medic, Chicago"

REDUCTION OF DEATHS IN HOSPITALS

Elsewhere in this issue (page 1384) is an article describing a new approach to the reduction of deaths in infants in hospitals. Since more infants die during the first three days of life than in the remaining 362 days of a year, there exists a grave challenge for all who are concerned with this early period in life. Progress in this field can be made only through understanding and cooperation. To achieve this, there must be a true appreciation of the real causes of death, accurate preparation of death certificates, and immediate investigation of all deaths in infants so that corrective measures can be enforced immediately to prevent more needless deaths.

In Chicago an exhaustive study was made to determine a procedure by which proper understanding and adequate control of death in early life can be attained. To obtain correct data on such deaths, a procedure was developed by which there is an immediate review of autopsy findings on the autopsy report and a comparison of these findings with the direct and underlying cause of death on the death certificate. An "alerter system" whereby hospital staffs can be made aware of their problems without delay was also developed. Of particular interest is the promptness by which attention can be drawn to problems that on study may be shown to be due to faulty practices. Correction of such practices will effect the saving of lives, which is of concern to all who are interested in the health and welfare of human beings. It is interesting, then, to speculate on the possibilities of the Chicago plan if applied elsewhere. This is a study that will interest physicians, hospital personnel, and public health officials.

NEW DRUGS—MIRACLES OR MIRAGES?

The development of new drugs for human use has been one of the most remarkable signs of progress. Until a few decades ago drugs at best were considered useful but seldom much more by the true medical scientists. During the last 20 years, however, the term "miracle drug" has become so widely known that profession and public alike use this term without more than momentary hesitation. The public is watchfully waiting and hoping for new remedies to lessen their suffering and economic burdens, and physicians are just as hopeful that they will have available an unending stream of newer and better agents to ease the suffering of their patients. Thus it is not unexpected to observe now and then signs of undeserved enthusiasm.

The development of any worth-while new drug or technique is not something that occurs overnight. The time, the money, and the manpower often spent in such searching is at times almost discouraging. And too often, the work does not produce the expected results. Nevertheless, researchers, pharmaceutical manufacturers, donors of research grants, directors of research institutions, and others continue to search for the new and to lend support and encouragement. There are many aspects of the development of a new drug that could be discussed, but available space limits this discussion. There are, however, two vexing problems that today more than ever seem to be the basis of much confusion and some differences of opinion. They involve the unfavorable reactions that are reported after a new drug is marketed and the publication of papers reporting these undesirable side-effects.

When a new drug is introduced into interstate commerce in the United States today it must have been subjected to tests sufficient to satisfy certain requirements of the Federal Food, Drug, and Cosmetic Act. This applies even to those items that can be sold only on the presentation of a prescription. In general, the data required to satisfy the Food and Drug Administration and medical and legal departments of the drug manufacturer are acquired only after exhaustive and searching research, performed usually by well-trained, well-informed, able, and conscientious investigators. There are exceptions, of course, but they are becoming fewer as each year passes.

Of much concern at times, however, is the observation made sometimes after a drug has been in general use for months and which reveals the possibility of occasionally occurring blood dyscrasia or other equally disturbing systemic reaction. It is not unusual to follow hundreds of tests on a new drug, decide that it seems to be free of the more undesirable side-effects, and then learn later that the unexpected happened. While it is possible to surmise that a given drug may produce a given effect, it is not possible to predict with certainty all that may occur. Drug therapy has not yet arrived, and may never arrive, at the point where diagnosis, treatment, and response can always be reduced to calculations on graphs. There will always be individual response and the need, therefore, for treating all patients individually and treating all drugs with respect.

From time to time a report appears in the literature on the bad results observed in some patient with one of the newer drugs. The editor of a medical journal does not necessarily accept the paper to warn others against the use of this drug. He merely wishes to draw attention to a problem that may only be in need of further study or that, on the other hand, may truly prove to be a timely warning for more than caution. There are many drugs now in common use about which much seemingly unfavorable

comment has appeared in medical literature. And yet they continue to meet a need for remedies in the fields for which they are intended. While physicians might lose little if some of these agents were to disappear, they would stand to suffer in their practice if all these remedies were discarded before better ones were developed to replace them. By accepting such papers for publication the editors are serving practitioners, patients, and the drug manufacturers. No one could in good conscience dispute the need for presenting the truth, provided all of the truth is offered, it is not distorted, and it is not printed with malicious intent. Modern drug therapy requires all interested parties to be properly informed and to meet their responsibilities.

The appearance of a report, or of several reports, on blood dyscrasias, kidney damage, or other reaction should not result in immediate condemnation of a drug. Time may prove that its use should not be continued, but until confirmatory reports appear the first should only serve as a warning for careful use. Even if other reports appear the physician may not give up use of the drug; he should, however, ask himself if the drug is truly indicated and if another equally effective but potentially less hazardous drug is available; if not, he should ask whether the advantages outweigh the disadvantages. If the prescriber is convinced after these questions that he is using the right drug, his training, experience, judgment, and conscience must be his guides. Presumably a drug is not administered unless indicated, but if it is then it is time for a reappraisal of one's medical habits more than for rejection of a drug that in careful hands is very useful.

When the practitioner, or his patient, today asks if the newer drugs are miraculous he only has to think of what practice was like before these drugs became available. Lives are saved, suffering is lessened, convalescence is shortened, complications are fewer, the days spent in hospitals are fewer—these and other truisms attest to the impact drug therapy has had on medical care. Perhaps some may question the wisdom of referring to modern drug therapy as miraculous, particularly since not all drugs are equally effective, but no well-informed person could classify all drugs as mirages.

SOLICITATION OF REPRINTS

Today, when only the largest libraries can attempt to subscribe to all the medical journals, reprints comprise an essential auxiliary to research, and most smaller libraries maintain reprint collections. However, in view of the cost of printing and the rise in mailing rates, Hedgpeth [1] declares that this is an appropriate time to call for courtesy and consideration in requesting reprints from authors. The purpose of a reprint, he points out, is to increase the dissemination of information, especially to those who might be most interested. A secondary purpose is to make specialized papers available to colleagues in a more convenient form than they are in the file of a library. Occasionally, reprints are distributed out of less laudatory motives.

An author's personal supply of reprints is limited and usually inadequate to fulfill his obligations to physicians who, it is thought, should have a copy of the paper, and the supply is usually obtained at some personal expense. Consequently, many authors prefer to reserve their reprints for persons actually in need of the paper. Authors would like to comply with all requests, since they cannot be certain that even the most terse request for a reprint is not made by someone whose desire for information is legitimate. But how can they be sure? This brings up the matter of courtesy and consideration in soliciting reprints.

The dispatch of requests on mimeographed postcards is, according to Hedgpeth, inconsiderate; postcards are often regarded as acts of discourtesy by authors whose work has been published at length and may represent years of arduous labor and much thought. He finds "postcard operators" especially distasteful, for this group sits at a journal table in the library with stacks of postcards, going through the current journals and filling in the blank spaces on the request cards. Many "postcard operators" hardly pause to read more than the title of a paper. In this connection, a more disagreeable variation is the printed card, apparently with the sanction of an institution or department, which concludes: "If you can spare two copies we would like to have one for our departmental library."

Several things are wrong with this practice. When the postcard arrives before the reprints are available, it is *prima facie* evidence that the journal is available in the institution, and therefore the need for the paper cannot be critical. Moreover, the procedure suggests that the sender of a request card is not disposed to read the paper as it lies before him and probably has not troubled to write down the reference. In all fairness, however, this is not intended to deny that reprint requests are frequently made by serious students with a legitimate need for the paper, although most authors would be more kindly disposed toward requests that are submitted in a more dignified and considerate manner.

Far too many requests are also made because a paper "looks interesting," or simply because they grow out of an ambition to build a reprint collection. Such requests do not provide valid reasons for soliciting reprints that may never be read. Another type of unjustified request is that made by persons who already subscribe to the journal in question or have a copy in which the article appears. This type of request may deprive an investigator in serious need of a reprint, thereby interfering with the proper function of an author's supply of reprints.

Thoughtful physicians are always interested in disseminating their ideas and the results of their investigations to interested colleagues. Nonetheless, indiscriminate postcard requests should be condemned. The least that can be expected is a request written in such a way as to indicate that the petitioner is really interested in the subject and that he respects the work he is asking for sufficiently to take the time to state why he needs a reprint.

1. Hedgpeth, J. W.: On Soliciting Reprints, Am. Scientist 42:497 (July) 1954.

ORGANIZATION SECTION

RESOLUTIONS FOR ATLANTIC CITY MEETING

Members of the House of Delegates are urged to send in copies of the resolutions they plan to introduce at the Atlantic City Meeting, June 6-10. Under the present procedure, each delegate is given mimeographed copies of all resolutions at the time he registers with the Committee on Credentials. The work of the Secretary's office in preparing these multiple copies is greatly facilitated if the resolutions can be received at the headquarters office ahead of time. It takes considerable time to process the resolutions and then ship them to Atlantic City.

STATEMENT BY DR. GEORGE F. LULL ON RESERVE FORCES BILL

March 17, 1955

Honorable Overton Brooks
Chairman, Subcommittee No. 1
Committee on Armed Services
House of Representatives
Washington 25, D. C.

Dear Mr. Chairman:

I would like to take this opportunity, on behalf of the American Medical Association, to submit for your consideration our views concerning H. R. 2967, 84th Congress, which is currently being studied by your Committee.

The stated purpose of the bill is to provide for strengthening of the Reserve Forces. It is our understanding that while the proposed program does not call for universal military training, it does call for short tours of active duty for training by a large number of trainees. We recognize that Congress may deem it necessary to expand the program at some future date. The initial establishment of sound principles in administering such a training program is a matter of the greatest importance because of this possibility. The purpose of this letter is to comment on the medical aspects of the program rather than to support or oppose its adoption.

The American Medical Association has been studying, for some time, the factors involved in the most effective utilization of medical manpower in time of national emergency, and particularly the medical requirements of the Armed Forces in situations which require relatively short periods of active duty by substantial numbers of non-career personnel. Our views have been made known to the National Security Training Commission and to appropriate committees of the Congress in connection with previous legislation. We believe that we can make a contribution at this time by reiterating three of the suggestions previously made.

(a)—Continuation of Pre-Professional and Professional Education for Qualified Students

It has always been the firm belief of the Association that should a program of Universal Military Training be adopted, it is imperative that safeguards be included to prevent any disruption in the education of an adequate force of professional personnel. In order to accomplish the basic underlying purpose of the Armed Forces Reserve Act, i. e., to provide an adequate force of well-trained reserves, it is essential that the education of specialists be permitted to proceed without impairment.

It is believed that the period of freedom from military training of specialists should extend to the completion of professional education rather than graduation from medical school. That is, a physician would not be considered available for induction until the completion of his internship training. In the implementation of this recommendation, it is essential that no advantage over civilian hospitals accrue to Armed Forces' hospitals by allowing internship and residency service in such installations to count against a person's total reserve obligation.

The Association believes that a person whose aptitude or previous accomplishments indicate that he can best contribute to the nation as a trained professional man, should be placed in a category which will permit him to continue his education. Such classification should be made at or before he reaches the age of induction. We also believe that the selection of students and the control of educational programs should remain in the hands of the individual colleges and universities.

(b)—Medical Care and Examination of Trainees

The treatment of injuries and sickness arising during or as a direct result of military service while a trainee under the proposed legislation will, of course, be a responsibility of the Government. Such treatment should be the same as that furnished currently to personnel of the Armed Forces. We believe, however, that the number of doctors per thousand inductees should not exceed the accepted requirements for the civilian population generally, because of the extremely short period of training and the favorable training conditions which will prevail. The absence of combat duty and overseas assignments makes it possible to provide adequate medical care by the utilization of civilian physicians on a part-time or full-time contract basis. In any event, it is believed unwise to enlarge the regular complement of the medical corps of the Armed Forces to provide additional medical personnel for this purpose.

The Association also recommends that preinduction, induction, and periodic Reserve examinations be conducted by civilian physicians on a fee basis, or by Reserve personnel, for the purpose of maintaining a satisfactory Reserve status. This system is now operating successfully with respect to periodic physical examinations for other Reservists. If full-time medical personnel of the Armed Forces are utilized for these examinations, it will be necessary to call into service a much larger number of physicians than is currently required.

(c)—Eligibility of Trainees for Veterans' Medical Benefits

Although trainees would seem to be eligible for the same benefits as members of the regular establishment, the Association desires to comment only with respect to medical and hospital benefits for non-service-connected disabilities.

Existing provisions of law permit the treatment of certain non-service-connected disabilities in Veterans' Administration facilities for persons, "including veterans, who serve, regardless of length of service, during a period of war, (a) if they were discharged under conditions other than dishonorable; and (b) who swear that they are unable to defray the expenses of hospitalization."

The American Medical Association is unalterably opposed to any suggestion which contemplates the extension of such care for non-service-connected conditions to trainees under the proposed program or other peace-time veterans. The use of the Veterans' Administration facilities for such purposes would create a need for additional facilities and increased medical staffs, thereby adding to the strain upon the health and medical manpower resources of the nation.

I respectfully request that the foregoing comments on behalf of the American Medical Association be included in and made a part of the record of hearings on H. R. 2967, 84th Congress.

Sincerely yours,
GEORGE F. LULL, M.D.
Secretary and General Manager.

SECOND STANDARD NOMENCLATURE INSTITUTE

The second Standard Nomenclature Institute will be conducted by the American Medical Association at headquarters, 535 N. Dearborn St., Chicago, Ill., May 23-25. The curriculum will consist of theory and coding practice in the Standard Nomenclature of Diseases and Operations and anatomy for medical record librarians as it relates to the topography section of the nomenclature. There will be no tuition charge. For information write the Standard Nomenclature office, at the above address, before May 9.

FEDERAL MEDICAL LEGISLATION

Seventh Installment, First Session, 84th Congress

Maternal and Child Health and Welfare

Congressman Reed (R., N. Y.), in H. R. 3292, has introduced the administration's measure for matching formulas for federal programs in maternal and child health and crippled children's and child welfare services. A new emphasis is placed on its improvement and special projects. Of the total sums appropriated by Congress for all maternal, child health, and welfare programs, the Secretary of Health, Education, and Welfare could set aside 15% for distribution nationally to finance special projects of regional or national significance. Grants could be made to state agencies, colleges, universities, or other nonprofit institutions. The remainder of the appropriations would be allocated to the state on the same formulas as at present. The Secretary of Health, Education, and Welfare would be given authority also to earmark funds not to exceed 15% for extension and improvement projects within the particular state. The special projects would have a four year limit, with the federal government contributing 75% of the cost the first two years and 50% the last two years. This measure was referred to the Committee on Ways and Means.

Mental Health

Mental Health Act Amendments.—Senator Purtell (R., Conn.), in S. 848, would amend the Public Health Service Act to give increased emphasis to meeting mental health problems and carrying out the administration's plans in this field. Provisions would be made for surveys and special studies to determine the amount, distribution, economic impact, and other effects of mental illness. The Public Health Service would participate in the planning and development of regional and interstate collaboration and cooperative projects and arrangements in the field of mental health, including joint planning for the joint use of highly trained or specialized personnel and interstate or regional use of physical facilities, including facilities for research and training. This would be a five year program, with the Surgeon General estimating the federal appropriations necessary to assist the states. This bill was referred to the Committee on Labor and Public Welfare.

Charter for Foundation for Aid to Mental Patients.—Congressman Broyhill (R., Va.), in H. R. 2564, would incorporate the Foundation for Community Aid for Mental Patients. "The objects and purposes of the corporation shall be: (1) to receive and administer funds for charitable purposes, and particularly in the assistance and/or rehabilitation of mentally and emotionally ill persons; and (2) to raise the standard of care afforded mentally ill patients in state and Federal mental hospitals and institutions." This bill was referred to the Committee on the Judiciary.

Medical Care for the Employees of Former Lighthouse Service

Congressman Hale (R., Maine), in H. R. 3116, proposes to provide for medical, surgical, and dental treatment and hospitalization for certain retired personnel of the former lighthouse service. This bill was referred to the Committee on Interstate and Foreign Commerce.

Federal Life and Health Insurance for Federal Employees

Congressman Fogarty (D., R. I.), in H. R. 3112, would authorize upon request of any federal employee the withholding from the individual's compensation "such amounts as may be necessary to: (1) pay the premiums under any contract of life, health, accident, hospital, and medical insurance which has been entered into by such officer or employee; and, (2) pay into an approved credit union any savings deposits authorized by such officer or employee. The amounts so withheld and deducted shall be paid to the insurer or insurers or to the approved credit union at such times and in such manner as shall be provided in the regulations of the Commission." This bill was referred to the Committee on Post Office and Civil Service.

Prepared by the Washington Office of the American Medical Association.

Federal Aid for Laboratory Construction

Senator Hill (D., Ala.), in S. 849, would authorize an appropriation of 30 million dollars annually for three years "to provide for grants-in-aid to accredited and non-profit universities and schools of medicine, dentistry, and osteopathy, hospitals, laboratories, and other non-profit institutions, engaged in or competent to engage in research for the purpose of defraying the cost of construction of facilities, or the installation of equipment, needed for the conduct of research into the causes of and possible cures for crippling and killing diseases, including cancer, heart disease, poliomyelitis, nervous disorders, mental illness, arthritis and rheumatism, blindness, cerebral palsy, and muscular dystrophy." A national council on medical research facilities would be appointed to pass upon applications for grants and make recommendations to the Surgeon General. No grants-in-aid could exceed one-half the cost of construction, including plans and specifications of the research facilities, or one-half the cost of installation of equipment in any Army or Navy hospital. This bill was referred to the Committee on Labor and Public Welfare.

Congressman Priest (D., Tenn.), in H. R. 3459, and Congressman Wolverton (R., N. J.), in H. R. 4114, have introduced bills identical to S. 849. Both bills were referred to the Committee on Interstate and Foreign Commerce.

Medical Care for Retired Enlisted Personnel

Congressman Boggs (D., La.), in H. R. 2556, would provide dispensary care in any Army or Navy hospital for retired enlisted personnel and "where hospital care is indicated and accommodations are available as determined by the commanding officer of the hospital concerned, retired enlisted personnel of the Army, Navy, Marine Corps, and Coast Guard, including members of the Fleet Reserve and Fleet Marine Corps Reserve, shall be entitled to hospitalization, including subsistence, without cost, in either Army or Navy hospitals." This bill was referred to the Committee on Armed Services.

Lengthening Presumption of Service Connection for Tropical and Chronic Diseases

Senator Sparkman (D., Ala.), in S. 896, would amend the veterans' regulations to lengthen the presumption of service connection for chronic and tropical diseases from one to three years after separation from the service. This bill was referred to the Committee on Finance.

Air Pollution

Senators Knchel and Knowland (R., Calif.) and Senators Martin and Duff (R., Pa.) propose, in S. 928, to amend the Water Pollution Control Act to provide for control of air pollution. The bill provides that the Surgeon General of the Public Health Service "shall after careful investigation and in cooperation with other Federal agencies, with State and local government air pollution agencies, with public and private agencies and institutions, and with industries involved, prepare or adopt comprehensive programs for eliminating or reducing air pollution." He would be given authority to encourage cooperation among political subdivisions and encourage technical research by private industry in this field. The Air Pollution Control Advisory Board would be created within the Public Health Service to advise the Surgeon General and to make recommendations. A five year appropriation would be authorized for grants-in-aid to states and to private individuals and to industries. This bill was referred to the Committee on Public Works.

Congressman McDonough (R., Calif.) has also introduced a bill, H. R. 3680, aimed at the air pollution problem. His bill is identical with that of Frelinghuysen's (R., N. J.) H. R. 2129, and H. R. 835 by Congressman Ray (R., N. Y.) and would provide for an appropriation of 5 million dollars "to provide for intensified research into the causes, hazards, and effects of air pollution, and the methods for its prevention and control." These bills were referred to the Interstate and Foreign Commerce Committee.

Hospital and Health Facilities for Mentally Ill of Alaska

Senator Neuberger (D., Ore.), in S. 1027, and Delegate Bartlett (D., Alaska), in H. R. 3991, propose to authorize and direct the Secretary of the Department of Health, Education, and Welfare to construct, equip, and maintain in Alaska a hospital for care and treatment of the mentally ill, and to construct other inpatient or outpatient mental health facilities necessary for a comprehensive program. Alaskan patients now cared for in Oregon would be transferred to the new facilities in Alaska and present conflicting authority in the law terminated. The Secretary of HEW, after consultation with the Secretary of Interior, is directly to "report to the Congress on the feasibility of transferring the responsibility of the Federal Government with respect to the care and treatment of mentally ill individuals of Alaska to the Territorial Government of Alaska." This bill was referred to the Committee on Labor and Public Welfare.

Senator Neuberger (D., Ore.) in S. 1028, has introduced a similar measure to H. R. 610 by Bartlett (D., Alaska) previously reported. Provision is made in both bills for voluntary and involuntary commitment procedures. Senator Neuberger's bill tightens the procedure for medical certification for involuntary hospitalization. A medical certificate would be required for two examiners (instead of one), one of whom must be "an individual licensed under the laws of Alaska to practice medicine or osteopathy." The individual would have the right to insist on judicial procedure before hospitalization. This was not provided in H. R. 610. This bill was referred to the Committee on Labor and Public Welfare.

Medical Care for Indigents

Congressman Reed (R., N. Y.) has introduced, in H. R. 3293, the administration's bill to amend the Social Security Act to earmark 20 million dollars for state aid for the care of public assistance groups to whose support the federal government contributes: "the aged, blind, dependent children, and the totally and permanently disabled." This would provide $3 per month for each old age assistance recipient, each blind person and each disabled person, and $1.50 for each dependent child. These sums would have to be matched by the states; the money would be exclusively for the medical care of these classes of indigents. In addition, out of separate appropriations, grants could be made to encourage the states "to minimize the need for . . . assistance by helping such individuals attain self-support or self-care." Furthermore, all states would have to declare in writing what steps they were taking to encourage the indigents to be more self-supporting. At the present time the United States government provides 80 million dollars a year in assistance payments for these indigents, but the money is not earmarked for medical care nor is matching required of the states. The 20 million dollars to be authorized and earmarked for medical care by H. R. 3293 is in addition to the 80 million dollars presently appropriated for public assistance but not earmarked for medical care. This bill was referred to the Committee on Ways and Means. Senator Cotton (R., N. H.), in S. 1198, has introduced an identical bill. This bill was referred to the Committee on Finance.

Federal Scholarships for Sciences

Congressman Powell (D., N. Y.) has proposed, in H. R. 2179, to authorize the U. S. Commissioner of Education to award scholarships "for college graduate level study in fields of engineering, physics, chemistry or similar scientific courses," which could include medicine. Scholarships would be awarded on the basis of competitive examinations. Payments for the scholarships would be made directly to the institutions. The scholarship would include tuition and customary school fees, such as laboratory, library, health and infirmary, books, supplies, and equipment. Board, lodging, and other living expenses and travel would not be included. The maximum allowance would be $2,000 per academic year. If the student applies for deferment for military service, the bill makes deferment mandatory "so long as he holds such scholarship." A commission of 12 members (none of whom is required to be a physician) would advise and consult with the commissioner in carrying out this act. The bill carries no authority for an appropriation. This bill was referred to the Committee on Education and Labor.

Senator Cotton (R., N. H.) has introduced a similar measure in S. 980. However, the scholarships would be limited to $1,000 and could provide for a limited subsistence allowance, payable directly to the student. This bill was referred to the Committee on Labor and Public Welfare.

Federal Aid to Medical Education

Congressman Burnside (D., W. Va.) has introduced H. R. 3297, which is identical with his medical education bill in the 82nd Congress. Congressman Anfuse (D., N. Y.) has introduced, in H. R. 3543, an identical bill. These bills propose to authorize 300 million dollars over a period of five years for construction and equipment of new medical schools and in construction and in improvement for existing medical, dental, public health, nursing, or "other schools for the education and training of health personnel." Half of the total would be earmarked for grants for construction for new medical schools; the other half would be to help finance the cost of improvement construction for existing schools in the health field. Applicants would first have to have been refused Hill-Burton grants. The Surgeon General would administer the law. He would have available the advice of a national council on professional health education, to be established under this bill. This bill was referred to the Committee on Interstate and Foreign Commerce.

Treaties

Congressman Smith (R., Wis.), in H. J. Res. 172, proposes an amendment to the constitution that would provide that "A treaty or other international agreement, or any provision thereof, not made in pursuance of this Constitution or in conflict with any of its provisions, shall not be the supreme law of the land nor have any force or effect. A treaty or other international agreement shall be effective as internal law within the United States only through legislation. On the question of advising on, and consenting to, the ratification of a treaty, the vote shall be determined by yeas and nays, and the names of the persons voting for and against shall be entered on the Journal of the Senate." The amendment must be ratified by three-fourths of the states within seven years if it is to become operative. This is similar to a number of previous bills on the subject and was referred to the Committee on the Judiciary.

PAMPHLETS ON VOLUNTARY HEALTH INSURANCE

The Council on Medical Service, at A. M. A. headquarters, has available five current pamphlets dealing with the general subject of voluntary health insurance. They are (1) "Voluntary Prepayment Medical Benefit Plans, 1954," (2) "Charts and Graphs, 1954" (supplement to the preceding pamphlet), (3) "The Growth of Voluntary Health Insurance," (4) "The Extent of Voluntary Health Insurance Coverage in the U. S., 1954," and (5) "The Health Insurance Story." The first three pamphlets are published by the Council on Medical Service and its Committee on Prepayment Medical and Hospital Service. The fourth and fifth are published by the Survey Committee of the Health Insurance Council. Requests for these pamphlets may be directed to the Council on Medical Service. Quantity orders for the Health Insurance Council pamphlets should be made to the nearest of the following addresses: 208 S. LaSalle St., Chicago 4, Ill.; 488 Madison Ave., New York 16, N. Y.; or 60 John St., New York 38, N. Y.

HOSPITAL MEDICAL LIBRARY SUGGESTIONS

The Council on Medical Education and Hospitals has revised its pamphlet "Hospital Medical Library Suggestions," originally published in THE JOURNAL in 1945. This pamphlet gives a list of both periodicals and books that is suggested as a guide to the needs of individual hospitals. No attempt was made to include all of the useful journals and books in the various fields, only a few having been selected that were thought particularly desirable for the average general hospitals. Copies of this pamphlet may be obtained on request to the Council on Medical Education and Hospitals, 535 N. Dearborn St., Chicago.

MEDICAL NEWS

ALABAMA

State Medical Meeting in Montgomery.—The annual session of the Medical Association of the State of Alabama will be held April 21-23 at the Whitley Hotel, Montgomery, under the presidency of Dr. Joseph M. Donald, Birmingham. Addresses of welcome will be made by the Hon. W. A. Gayle, mayor of Montgomery, and Dr. Archie E. Thomas, Montgomery, president, Montgomery County Medical Society. The Jerome Cochran Lecture, "The Role of Medicine in the United Nations and in International Relationships," will be delivered by Dr. Charles W. Mayo, Rochester, Minn., Friday morning. Other presentations by out-of-state speakers include:

Surgical Management of Chronic Thyroiditis (Hashimoto's Disease), David Henry Poer, Atlanta, Ga.
Congenital Anomalies of the Gastrointestinal Tract, Willis J. Potts, Chicago.
Jaundice in Early Infancy, John A. Bigler, Chicago.
A Rational Basis for Treatment of the Toxemias of Pregnancy, Allan C. Barnes, Cleveland.
Use and Abuse of Endocrines in Gynecology, Robert B. Greenblatt, Augusta, Ga.
Current Advances in the Diagnosis and Treatment of Cardiospasm and Hiatal Hernia, Herman J. Moersch, Rochester, Minn.
Isotope Techniques ,Useful in Diagnostic Procedures, Kenneth E. Corrigan, Ph.D., Detroit.

CALIFORNIA

Pediatric Spring Clinics.—The Valley Children's Hospital and Guidance Clinic, Fresno, has planned a pediatric meeting, April 22-24. Dr. Sydney S. Gellis of Boston and Dr. Robert H. Alway of Denver will be guest speakers. Applicants may make reservations through the administrator of the Valley Children's Hospital.

Residency Training at New Medical Center.—The new University of California Medical Center in Los Angeles plans to offer a residency training program in psychiatry, beginning in July. Two second-year residents will be appointed to the center's psychiatric inpatient and consultation services and four first-year residents, initially, to the psychiatric outpatient clinic. The medical school portion of the center is already in use, and the 320 bed teaching hospital is expected to open in April. Plans are being made for the construction of a 248 bed Neuropsychiatric Institute, to be built as a wing of the new medical center. The institute will include the following facilities: beds for child, adolescent, and adult psychiatry, neurology, and neurosurgery; an outpatient clinic for undergraduate and graduate training programs in psychiatry and allied disciplines; a neuropathology laboratory and museum; and research laboratories. It will be operated jointly by the state department of mental hygiene and the University of California.

ILLINOIS

Meeting on Mental Health.—The 46th annual meeting of the Illinois Society for Mental Health will be held at the Standard Club, Chicago, April 20 (luncheon tickets, $3.50). Dr. Alfred H. Stanton, Washington, D. C., co-author of "The Mental Hospital," will report on the findings of a recently published study of institutional participation in psychiatric illness and treatment.

Meeting on Hypnotherapy.—The Veterans Administration Hospital at Downey will present a seminar on hypnotherapy, April 20, 10 a. m. Discussion of a tape recording of a hypnotherapeutic session will be held at 1:30 p. m. The speaker will be Dr. Lewis R. Wolberg, assistant clinical professor of psychiatry, New York Medical College, Flower and Fifth Avenue Hospitals, New York.

Public Health Meeting.—The Illinois Public Health Association in cooperation with the Middle States Public Health Association will meet at the Morrison Hotel, Chicago, April 20-22. At 2:15 p. m. Dr. Winston H. Tucker, commissioner of health, Evanston City Health Department, will participate in a panel discussion, "Personnel Relationships in Health Departments," for which Pearl Bayne, P.H.N., M.P.H., head, school health section, bureau of maternal and child health, Illinois Department of Public Health, will be moderator.

Physicians are invited to send to this department items of news of general interest, for example, those relating to society activities, new hospitals, education, and public health. Programs should be received at least three weeks before the date of meeting.

Chicago

Davis Memorial Meeting.—The Society of Medical History of Chicago will hold a joint meeting with the Chicago Medical Society April 20 in the Palmer House. The program of this meeting, in memory of Dr. D. J. Davis, will be based on the recently completed "History of Medical Practice in Illinois." The speakers will be Drs. Frederick H. Falls, Chicago, Thomas Kirkwood, Lawrenceville, Ill., and William Mann, Chicago. A dinner will precede the meeting.

New Chief of Clinics.—Dr. Edward S. Petersen, acting chief of professional services at the Veterans Administration Hospital, has been appointed medical director of the Montgomery Ward clinics, Northwestern University Medical School, and director of the school's graduate division. Retiring director of the clinics is Dr. Harley E. Cluxton Jr., who will devote full time to private practice. Dr. Gordon W. Raleigh, former graduate division director, will give his time to private practice and to the directorship of graduate teaching at Evanston Hospital.

IOWA

State Medical Meeting in Des Moines.—The Iowa State Medical Society will hold its annual meeting April 24-27 at the Veterans Memorial Auditorium, Des Moines. The president's address by Dr. Gerald V. Caughlan, Council Bluffs, Monday, 9:15 a. m., will be followed by the address of the president-elect, Dr. Lonnie A. Coffin, Farmington. At 10 a. m. Dr. George T. Pack, New York, will deliver the Erskine Lecture, "The Extension of Radical Surgery in the Treatment of Cancer." At 11 a. m. Tuesday Dr. Elmer Hess, Erie, Pa., President-Elect of the American Medical Association, will deliver an address, "You Are the A. M. A." Other topics by out-of-state speakers at the general sessions include:

Treatment of Adolescents, J. Roswell Gallagher, Boston.
What Does Blue Shield Mean to You? Francis T. Hodges, San Francisco.
Diagnostic Approach to a Hemorrhagic State, Armand J. Quick, Milwaukee.
Complications of First Stage Labor, Roy E. Nicodemus, Danville, Pa.
Indications for Surgical Treatment of Vaginal Relaxation, Uterine Prolapse, and Retrodisplacement of Uterus, E. Stewart Taylor, Denver.
Pathology of Pulmonary Lesions, James B. McNaught, Denver.
Management of Colles Fracture, Lee T. Ford Jr., St. Louis.
Hematuria, Charles C. Higgins, Cleveland.
Useful Heart Operations, Dwight E. Harken, Boston.
Carcinoma of the Lung, Fay H. Squire, Chicago.
Emergency Medical Service in a Disaster, Harold C. Lueth, Evanston, Ill.

The meeting of the urologic section, Tuesday, will be opened at 2 p. m. with introductory remarks by Dr. Hess and will end with a pyelographic clinic by members of the Iowa Urological Society, for which Dr. Higgins will serve as moderator. On Tuesday at 4 p. m. Dr. Harry H. McCarthy, Omaha, will discuss "Choice of Gastric Surgery on a Physiologic Basis" before the surgical section. Special luncheons and dinners have been planned by various medical societies to coincide with the state medical meeting.

KANSAS

Sherwood Lectureship.—The Alpha Iota chapter of Phi Beta Pi fraternity will hold the 19th annual Noble P. Sherwood Lectureship, April 20, 8 p. m., at Malott Hall, University of Kansas, Lawrence. Dr. Roscoe L. Pullen, dean of the University of Missouri School of Medicine, Columbia, will discuss "Why Train for General Practice?"

KENTUCKY

Dr. Bailey Honored.—At a program in Harlan, more than 200 friends recently paid tribute to Dr. W. Clark Bailey of that city, Vice-President of the American Medical Association and former president of the Kentucky State Medical Association. The program, which followed the format of the TV show, "This Is Your Life," began with his early boyhood and continued through to the present, depicting Dr. Bailey's many activities in the fields of education, religion, civic clubs, public health, and organized medicine.

Course in Pediatrics.—A postgraduate course in pediatrics will be given at Louisville Childrens Hospital each Tuesday, May 3 through June 21, by the department of pediatrics of the University of Louisville School of Medicine in cooperation with the Kentucky State Medical Association. Poliomyelitis, fluid therapy of diarrhea, and pediatric urology are among the subjects to be discussed by guest lecturers and university professors. The American Academy of General Practice has approved the course for 24 hours' formal credit in postgraduate work.

Dr. Price to Speak on "Senior Day" Program.—Dr. Julian P. Price, Florence, S. C., will speak at the dinner closing the first annual Senior Day program, sponsored by the Kentucky State Medical Association, April 18, at the Kentucky Hotel, Louisville. The Jefferson County Medical Society will be host to the 1955 senior class of the University of Louisville School of Medicine at the dinner social hour. The program, at 2 p. m., will include talks and panels designed to help the student bridge the gap between his academic training and the actual practice of medicine. "Beyond the Ranges" is the title of Dr. Price's address. Dr. Price is a member of the American Medical Association Board of Trustees and of the Joint Commission on Accreditation of Hospitals.

General Practitioners Meet in Louisville.—The Kentucky chapter of the American Academy of General Practice will hold its annual meeting at the Brown Hotel, Louisville, April 20-21, under the presidency of Dr. Garnett J. Sweeney, Liberty. Presentations by out-of-state speakers include:

Pitfalls in the Diagnosis of the Acute Surgical Abdomen, William T. Fitts Jr., Philadelphia.
Emergencies in Diabetes, Howard F. Root, Boston.
Surgical Therapy in Cardiovascular Disease, Charles A. Hufnagel, Washington, D. C.
Thromboembolism, James O. Ritchey, Indianapolis.
The Sterile Couple, Bernard Weinstein, New Orleans.
Viral Hepatitis, Perry J. Culver, Boston.

At the subscription dinner Wednesday, 7 p. m., Mr. Donald Cooley, Scarsdale, N. Y., magazine editor and writer, will speak. All members of the Kentucky State Medical Association are invited to attend.

MARYLAND

State Medical Meeting in Baltimore.—The annual meeting of the Medical and Chirurgical Faculty of the State of Maryland will be held April 21-23 under the presidency of Dr. George H. Yeager, Baltimore. All members of the faculty are welcome to attend the meeting of the House of Delegates, Thursday morning at the Deutsches Haus, 1212 Cathedral St. Members and their wives are welcome at the luncheon that will be given at the Sheraton Belvedere Hotel under the auspices of the woman's auxiliary. The afternoon scientific session in Osler Hall will open with a discussion of "Infection in the Newborn" by Dr. Edmund R. McCluskey, Pittsburgh, after which Dr. Elmer Hess, Erie, Pa., President-Elect of the American Medical Association, will present "The General Practitioner as an Urologist." Dr. Hess will deliver the I. Ridgeway Trimble Lecture, "Are We Afraid to Face Facts?" at the presidential dinner, 6:30 p. m., at the Sheraton Belvedere. The Friday afternoon session will open with presentation of the John M. T. Finney Fund Lecture, "The Surgical Treatment of Peptic Ulcer," by Dr. J. Deryl Hart, Durham, N. C. Mr. John O. Moore, New York, will have as his topic "Types, Frequency, and Seriousness of Injury Associated with Accidents in Passenger Automobiles," and Dr. Anthony F. DePalma, Philadelphia, will speak on soft tissue disorders about the shoulder joint. A ball will be held at the Emerson Hotel, Friday, 9:30 p. m.

MASSACHUSETTS

Seminar on Peripheral Vascular Disease.—The Third (B. U.) Surgical Service of the Boston City Hospital is presenting its second annual surgical seminar in the Cheever Amphitheatre, April 22, from 9:30 a. m. to 4:30 p. m. Dr. Eugene E. O'Neil, surgeon-in-chief, Third (B. U.) Surgical Service, Boston City Hospital, and professor of clinical surgery, Boston University School of Medicine, will be chairman for the following program:

Post-Traumatic Sympathetic Dystrophy, George F. Miller, Boston.
Clinicopathologic Course of Thromboangiitis: Therapeutic Considerations, Henry Haimovici, New York.
Transmetatarsal Amputation, George P. Whitelaw, Boston.
Experiences with Vessel Substitution in Peripheral Vascular Diseases, William S. Dye, Chicago.
Segmental Femoropopliteal Arterial Occlusion Treated with Resection and Grafting, D. Emerick Szilagyi, Detroit.
Medical Management of Arterial Occlusive Disease, A. Wilbur Duryee, New York.
Thrombophlebitis: A Study of 748 Cases, John J. Byrne, Boston.
Studies in Venous Thrombosis, John A. McLachlin, London, Ontario, Canada.

MICHIGAN

Narcotic Violation.—Dr. Peter W. McDonald, 1801 Vinewood Ave., Wyandotte, on his plea of guilty to count one of an indictment charging a violation of USC Title 26, Section 2554, in the U. S. District Court at Detroit, received a suspended sentence and was placed on probation for two years.

Conference on Anesthesiology.—A postgraduate conference on anesthesiology will be held in the Medical Science Building, Wayne University, 1401 Rivard, Detroit, April 21-23, under the sponsorship of Wayne University College of Medicine and the City of Detroit Receiving Hospital (fee, $40). On Thursday morning there will be panel discussions of the inhalation agents; on Friday afternoon a panel discussion of obstetrical anesthesia; and on Saturday morning a concluding discussion of special problems.

Medicolegal Institute.—Under the sponsorship of the State Bar of Michigan a Medicolegal Institute will be held at the Sheraton-Cadillac Hotel, Detroit, April 21-22. Registration fee is $25. The institute will be presented by 27 Michigan physicians. Among the speakers will be Dr. Albert C. Furstenberg, dean, University of Michigan Medical School, Ann Arbor, and Gordon H. Scott, Ph.D., dean, Wayne University College of Medicine, Detroit. The following topics will be discussed: The Human Cell—Its Life and Death; Relation of Trauma to Disease; Medicolegal Aspects of Medical Examinations; Stress and Strain; Fundamental Principles of Surgery; Surgery—Regional Injuries; Medicolegal Aspects of the Eye; Medicolegal Aspects of the Ear; and Medicolegal Aspects of Burns.

MONTANA

Legal-Medical Institute.—In cooperation with the Montana Medical Association, the Montana Bar Association will sponsor a legal-medical institute at the Cascade County Courthouse, Great Falls, April 22-23. The meeting will open Friday at 9:45 a. m. with welcoming addresses by Wesley W. Wertz, president, Montana Bar Association, and Dr. John J. Malee, Anaconda, president, Montana Medical Association, after which "Human Anatomy in Relation to Trauma" will be considered by Dr. Raymond F. Peterson, Butte, and "Medical Knowledge and the Law" by Robert S. Sullivan, assistant dean, Law School, Montana State University, Missoula. At 11 a. m. "Improving Relationships Between the Medical Profession and the Legal Profession" will be discussed by Edwin J. Holman, LL.B., Chicago, American Medical Association Bureau of Legal Medicine, and J. C. Garlington, attorney at law, Missoula. The following program will be presented Friday afternoon:

The Adequate Examination of an Injured Person, James C. Shields, Butte.
Workmen's Compensation—Its Problems From the Medical and Legal Points of View, Robert S. Swanberg, attorney at law, Helena.
Injury to Soft Tissues, Alfred M. Lueck, Livingston.
Medicolegal Aspects of Injuries to the Spine and Lower Back, Louis W. Allard, Billings.

The evening session will be devoted to a panel, "Presentation of Expert Testimony—the Hypothetical Question." On Saturday morning "Craniocerebral Trauma: Injuries to the Head" will be

discussed by Dr. David R. Johnson, Missoula; "Relation of Neurosis to Trauma," by Dr. Winfield S. Wilder, Great Falls, and "Preparation of Medical Testimony," by Franklin S. Longan, attorney at law, Billings. In the afternoon, "Techniques and Tactics in Presentation of Medical Evidence" will be explained by Melvin M. Belli, attorney at law, San Francisco. A cocktail party is scheduled for 5 p. m. at the Rainbow Hotel.

NEBRASKA

Psychiatrists Meet in Omaha.—The Midwest American Psychiatric Association Regional Research Conference will convene at the Nebraska Psychiatric Institute in Omaha April 22-23. The theme will be "Pharmacology in Psychiatric Therapy and Research." Among the participants will be Dr. Paul H. Hoch, principle research psychiatrist, New York State Psychiatric Institute; Dr. Nathaniel S. Apter, chairman, division of psychiatry, University of Chicago School of Medicine; William A. Hunt, Ph.D., chairman, department of psychology, Northwestern University Medical School, Chicago; Dr. Harold E. Himwich, director of the Galesburg (Ill.) State Research Hospital research division; Dr. Russell Meyers, chairman, division of neurosurgery, State University of Iowa College of Medicine, Iowa City; Dr. Louis A. Gottschalk, chairman, department of psychiatry, University of Cincinnati College of Medicine; and Dr. Archibald R. McIntyre, chairman, department of physiology and pharmacology, University of Nebraska College of Medicine, Omaha. Reuben G. Gustavson, Ph.D., from Resources for the Future, Inc., Washington, D. C., will address the dinner meeting Friday. On Saturday afternoon a panel discussion will emphasize research problems and techniques related to an evaluation of the basic mechanisms of some new pharmacological agents used in psychiatry.

NEW YORK

Scheinbach Memorial Lecture.—The third annual Emanuel B. Scheinbach Memorial Lecture, "Movement of Microorganisms in the Host's Tissues," will be delivered by Dr. Paul B. Beeson, Ensign Professor of Medicine, Yale University School of Medicine, New Haven, Conn., at 8:30 p. m., April 21, in the solarium of the Maimonides Hospital of Brooklyn.

Alumni Day.—The annual alumni day of the State University College of Medicine at New York City, Brooklyn, will take place April 30. The scientific session at Polhemus Clinical Hall in the morning will be followed by the annual business meeting. Luncheon will be served in the nurses' dining room at the Long Island College Hospital. At 7 p. m. there will be a dinner dance for the benefit of the Research, Scholarship, and Student Loan Fund, at the Hotel Granada, 268 Ashland Place, Brooklyn.

New York City

Tumor Clinic.—Dr. Irving F. Enquist, assistant professor of surgery, Kings County General Hospital, Brooklyn, will present "The Second Look in Cancer" at the tumor clinic conference, Harlem Hospital, April 20, 10:45 a. m.

Course on Malignant Diseases.—The pediatric department of the Memorial Center for Cancer and Allied Diseases announces a comprehensive course, April 27-29, for pediatricians, general practitioners, and health officers, in which current developments and established methods in diagnosis, differential diagnosis, and management of tumors, Hodgkin's disease, leukemia, and reticuloendothelioses in childhood will be studied. The course includes ward rounds, seminars, demonstrations, and examinations of children in pediatric, surgical, chemotherapy, and radiotherapy clinics. Twenty members of the attending staffs of Memorial Hospital and Sloan-Kettering Institute for Cancer Research will form the faculty. The class is limited to 15 physicians. Fee, $35. Information may be obtained from Director, Pediatric Service, Memorial Center, 444 E. 68th St., New York.

Health Education Conference.—The New York Academy of Medicine (2 E. 103rd St.) will present on April 21-22 the 15th Eastern States Health Education Conference, with the joint sponsorship of the department of health, city of New York; Brooklyn Tuberculosis and Health Association; New York Tuberculosis and Health Association; Queensboro Tuberculosis and Health Association; Maternity Center Association; New Jersey Tuberculosis League; New York City Cancer Committee; State Charities Aid Association; and the Wenner-Gren Foundation for Anthropological Research. "Goal Oriented Health Education" is the theme of the conference. The address of welcome will be given by Dr. Edward J. Donovan, president of the academy. The concluding presentation of the morning session will be made by Dr. W. W. Bauer, Chicago, Director, American Medical Association Bureau of Health Education, on "Quacks and the Perversion of Goals in Education." The Friday morning session will be a workshop in which demonstrations and critique of current practices in health education will be made and requisite adaptive changes in current health education practices discussed. The afternoon session will deal with industrial health education and old age and geriatric health education. A dinner meeting will be held Thursday at 7 p. m.

NORTH CAROLINA

Nalle Clinic Lectures.—On April 22 the sixth annual Nalle Clinic Foundation Lectures will be presented at the Veterans Recreation Center, Charlotte. At 5 p. m., Dr. John M. Beal, associate professor of clinical surgery, Cornell University Medical College, New York, will discuss "Nutritional Problems of Surgical Patients." At 8 p. m. Dr. Joe Vincent Meigs, clinical professor of gynecology, Harvard Medical School, Boston, will present the sixth Brodie C. Nalle Lecture. His subject will be "Endometriosis." All physicians in Charlotte and the surrounding counties are invited to attend.

OHIO

Dr. Robbins to Discuss Poliomyelitis.—The Upsilon chapter of Phi Delta Epsilon fraternity at the Western Reserve University School of Medicine, Cleveland, will hold its ninth annual lectureship, April 22, 8:30 p. m., in the auditorium of the Mount Sinai Hospital in Cleveland. The guest speaker will be Dr. Frederick C. Robbins, professor of pediatrics at the university, chairman of the department of pediatrics at City Hospital, Cleveland, and Nobel Laureate in Medicine for 1954, who will discuss "Recent Advances in Poliomyelitis."

State Medical Meeting in Cincinnati.—The Ohio State Medical Association will hold its annual meeting April 19-22 at the Netherland Plaza Hotel, Cincinnati. The general session will open at 2 p. m., Thursday, with a panel discussion, "Role of Surgery and Radioactive Iodine in the Management of Thyroid Disease," for which Dr. Robert M. Zollinger, Columbus, will serve as moderator. At 3:30 p. m. Dr. Garfield G. Duncan, Philadelphia, will discuss "The Therapy Spectrum in the Management of Essential Hypertension," and at 4 p. m. Dr. Stevens J. Martin, Hartford, Conn., will speak on preinduction responsibility of the anesthetist. The annual banquet will be held at 7:30 p. m. "A Review of Immunization Procedures in General and Pediatric Practice" by Dr. Aims C. McGuinness, Washington, D. C., will precede a panel presentation on cortisone and corticotropin (ACTH), with Dr. Marion A. Blankenhorn, Cincinnati, as moderator (11 a. m., Friday). Panel discussions have been scheduled by various sections: Surgery (1. Cardiac Arrest: Prevention and Treatment. 2. Cancer of the Breast: A Surgical Disease?); General Practice (Staff Privileges of the General Practitioner); Ophthalmology (1. Central Chorioretinitis. 2. Intraocular Tumors); Otorhinolaryngology (Middle Ear Effusion); and Anesthesiology (Safety in Emergency Operations).

Wednesday has been designated as "specialty society day." Medical motion pictures will be shown from 9 a. m. to 12 noon. The Conference of Officers and Committee Chairmen of County Medical Societies will meet by invitation at 9:30 a. m. Dr. Merrill D. Prugh, Dayton, president, Ohio State Medical Association, will preside, and Mr. Charles S. Nelson, executive secretary, will serve as moderator for the panel discussion, "The A, B, C's of Disciplinary Action." At 10:45 a. m. Mr. Leo E. Brown, Chicago, Director, American Medical Association Department of Public Relations, will discuss "Medicine in the Public Eye," after which Dr. David W. Heusinkveld, Cincinnati, president-elect, Ohio State Medical Association, will discuss "The Physician and the A. M. E. F." The luncheon speaker, Dr. Ernest B.

Howard, Chicago, Assistant Secretary, American Medical Association, will present "National Issues Confronting Medicine." Dr. Francis W. Davison, Danville, Pa., guest speaker for the section on otorhinolaryngology, will report on the use of drugs in otolaryngology. "Practical Considerations in the Management of Diabetes" will be offered by Dr. Duncan during the meeting of the section on internal medicine Thursday morning. This section will present a clinicopathological conference at 11 a. m. "Thirty-Two Cases of Cervical Disk Disease" will be discussed before the section on neurological surgery, Thursday, 10:10 a. m. by Drs. Eric T. Yuhl, Duke E. Hanna Jr., and Theodore B. Rasmussen, Chicago. At 11:20 a. m. Dr. James L. Poppen, Boston, will discuss "The Neurosurgeon Views Spontaneous Subarachnoid Hemorrhage."

OREGON

Annual Alumni Meeting.—The 40th annual Alumni Association meeting of the University of Oregon Medical School will be held on the campus in Portland, April 18-20, in conjunction with the Oregon Academy of General Practice meeting and the Sommer Memorial Lectures. The academy will have as its speaker Dr. James L. Dennis, formerly associate professor of pediatrics, University of Texas School of Medicine, Galveston, and presently in practice in Oakland, Calif. The Sommer Memorial Lecturers will be Dr. Henry L. Bockus, professor of medicine, University of Pennsylvania Graduate School of Medicine, Philadelphia; Dr. Peter C. Kronfeld, professor of ophthalmology, University of Illinois College of Medicine, Chicago; and Dr. Francis D. Moore, surgeon-in-chief, Peter Bent Brigham Hospital, Boston.

PENNSYLVANIA

Meeting on Tuberculosis.—The 63rd annual meeting of the Pennsylvania Tuberculosis and Health Society will convene at the Hotel William Penn in Pittsburgh April 20-22. At the luncheon Wednesday, 12:30 p. m., Dr. Thomas Parran, dean, graduate school of public health, University of Pittsburgh, will present "TB—No Boundaries Respected." "Today's Challenge," the theme of the conference, will be the subject of the opening address Wednesday afternoon by Dr. James E. Perkins, New York, managing director, National Tuberculosis Association, after which "Focusing the Search" will be presented by Dr. Robert E. Plunkett, Albany, assistant commissioner, Division of Tuberculosis, New York State Department of Health, and discussed by Dr. Katharine R. Boucot, professor of preventive medicine, Woman's Medical College of Pennsylvania, Philadelphia. Thursday morning will be devoted to consideration of more effective community-school health programs. Dr. David A. Cooper, president, Philadelphia Tuberculosis and Health Association, and professor of clinical medicine, University of Pennsylvania Graduate School of Medicine, will preside at the joint luncheon session of the Pennsylvania Tuberculosis and Health Society, Pennsylvania Trudeau Society, and Pennsylvania Conference of Tuberculosis Workers, when "The Value of the Tuberculin Test" will be discussed by Dr. J. Arthur Myers, professor of medicine and public health, University of Minnesota Medical School, Minneapolis.

Philadelphia

Hurd-Mead Lecture.—The Kate Hurd-Mead Lecture, under the sponsorship of the Woman's Medical College of Pennsylvania and the section of medical history of the College of Physicians of Philadelphia, will be held April 21 at the college. The guest speaker, Dr. Lloyd G. Stevenson, associate professor of medical history and literature at the University of Western Ontario Faculty of Medicine, London, Ontario, Canada, will present "Biography versus History."

Austrian Physicians Give Course on Fractures.—The Philadelphia Regional Committee on Trauma, American College of Surgeons, announces a fracture course by Drs. Lorenz Bohler, Vienna, and Jorg Bohler, Linz, Austria, April 21-23, at the College of Physicians of Philadelphia, 19 S. 22nd St. The course will be supplemented with discussions by outstanding American fracture surgeons. Each day's sessions will last from 9 a. m. to 12 noon and from 2 to 5 p. m. Reservations for the course will be limited to 400. The fee for practicing physicians will be $50 and for residents, interns, and medical students $25. Application blanks may be secured from Dr. William T. Fitts Jr., Secretary-Treasurer, Philadelphia Regional Committee on Trauma, 301 S. 21st St., Philadelphia 3.

Course on Stress and Aging.—A course on stress and aging will be given April 20-23 at the Lankenau Hospital, Lancaster Avenue, West, at City Line, with Dr. Edward L. Bortz as director. The course, which has been arranged by the American College of Physicians, will consist of seven symposiums. Out-of-state faculty members will include: Dr. Francis J. Braceland, Hartford, Conn.; Dr. Richard M. Brickner, New York; Drs. John S. L. Browne and Hans Selye, Montreal, Canada; Josef M. Brozek, Ph.D., and Ancel B. Keys, Ph.D., Minneapolis; Drs. Elmer L. Caveny and Wallace M. Yater, Washington, D. C.; David B. Dill, Ph.D., Army Chemical Center, Md.; Drs. Franz J. Ingelfinger, Chester M. Jones, and Harry C. Solomon, Boston; Dr. Nils P. Larsen, Honolulu; Olive M. McCay, Ph.D., Ithaca, N. Y.; Dr. E. Sterling Nichol, Miami; and Dr. Salvador Zubiran, Mexico, D. F.

Course on Rehabilitation.—A new, free, five day course in principles of rehabilitation (enrollment limited to 25) was initiated March 21, by the Rehabilitation Center of the Hospital of the University of Pennsylvania in cooperation with the Office of Vocational Rehabilitation, United States Department of Health, Education and Welfare. It will be repeated during the weeks beginning April 18, May 16, June 13, and July 18. The course, which will be open to physicians, dentists, registered nurses, occupational therapists, social workers, rehabilitation counselors, and others concerned with rehabilitation of the handicapped, is designed to present the basic concepts of rehabilitation. Provision for granting trainee stipends ranging from $50 to $100 to eligible persons attending the course has been made by the United States Office of Vocational Rehabilitation. Applications for these stipends should be addressed to the Rehabilitation Center at the University Hospital.

Pittsburgh

Course in Slit-Lamp Biomicroscopy.—The committee on postgraduate education of the Montefiore Hospital announces an advanced course in slit-lamp biomicroscopy of the living eye, combined with additional courses in ocular gonioscopy, indirect ophthalmoscopy, surgery of intraocular foreign bodies, surgery of cataract, and retinal detachment surgery, to be given April 25-29 from 8:30 a. m. to 4 p. m. by the Montefiore department of ophthalmology under the direction of Dr. Harvey E. Thorpe and associates. The fee is $75; a deposit of $25 is required for registration. For information write to A. Krajeck, Secretary of Postgraduate Ophthalmic Courses, 323 Jenkins Building, Pittsburgh 22.

TEXAS

Course in Poliomyelitis.—Baylor University College of Medicine, Southwestern Poliomyelitis Respiratory Center, and Jefferson-Davis Hospital, Houston, in cooperation with the National Foundation for Infantile Paralysis, Inc., announce a postgraduate course, "The Clinical Management of Poliomyelitis," April 19-21. The course is designed for physicians, nurses, medical social service workers, and physical and occupational therapists, to cover complete care of poliomyelitis with emphasis on the severely involved patient, the physician's responsibility in the effective coordination of auxiliary services, and the value of comprehensive care. A syllabus and further information may be obtained from Dr. William A. Spencer, Medical Director, Southwestern Poliomyelitis Respiratory Center, Jefferson-Davis Hospital, 1801 Buffalo Drive, Houston 3.

Course in Dermatology and Endocrinology.—The University of Texas Postgraduate School of Medicine, El Paso Division, offers a course in dermatology and endocrinology, April 17, 8:30 to 4:30 p. m., at the Turner Home, 1301 Montana St., El Paso. The morning session will cover dermatological allergy; common dermatoses of interest to general practitioners; and diagnosis and treatment of superficial mycotic infections. The afternoon session will deal with disseminated arteritis; hyperthyroidism, with special attention to its surgical aspects; pancreatitis; and some endo-

crinological aspects of the posterior pituitary and hypothalamic disease. Seven units of credit will be allowed members of the American Academy of General Practice. The tuition fee will be $10. Inquiry may be made at the University of Texas Postgraduate School of Medicine, Texas Medical Center, Houston 25 (LOcust 1169).

State Medical Meeting in Fort Worth.—The 88th annual session of the Texas Medical Association will convene in Fort Worth, April 24-27, under the presidency of Dr. Francis J. L. Blasingame, Wharton. At 10:35 a. m., Monday, Dr. Walter B. Martin, Norfolk, Va., President, American Medical Association, will address the general meeting on "Medicine in an Industrial Civilization." The program for the general sessions includes the following presentations by out-of-state physicians:

Functional Disorders, Frank N. Allan, Boston.
Acute Complications of Fractures, William H. Bickel, Rochester, Minn.
Anxiety and Depression as Seen in General Practice, Francis J. Braceland, Hartford, Conn.
Experiences in Surgery of Hepatic Neoplasms—Primary and Secondary, Alexander Brunschwig, New York.
Child and Crime, Douglas M. Kelley, Berkeley, Calif.
The Hyperventilation Syndrome in Clinical Medicine, William J. Kerr, San Francisco.
Diagnosis and Treatment of Precancerous Lesions of the Skin, C. Ferd Lehmann, San Antonio.
Fluorides in Daily Life, Nicholas C. Leone, Bethesda, Md.
Progress with Dolitrone—Analgesic and Anesthetic, John S. Lundy, Rochester, Minn.
Role of Smoking in the Production of Lung Cancer, Alton Ochsner, New Orleans.
Indications for Surgical Treatment of Peptic Ulcer, Robert L. Sanders, Memphis, Tenn.
Prospects for Control of Poliomyelitis, S. Edward Sulkin, Ph.D., Dallas.

These speakers, together with 17 others, will make presentations before various sections and societies that will hold their meetings simultaneously with those of the state association. The general meeting luncheon is scheduled for Wednesday, 12:30 p. m., at the Hotel Texas, where the other general sessions will be held. The incoming president, Dr. John L. Cochran, San Antonio, will give an address at 1:45 p. m., which will be followed by "How to Get Action for Liberty," by Mr. Leonard E. Read, Irvington-on-Hudson, N. Y., president, Foundation for Economic Education. The woman's auxiliary to the Texas Medical Association will meet concurrently.

WEST VIRGINIA

Society News.—The annual travel meeting of the West Virginia Obstetrical and Gynecological Society is scheduled for April 29-30 at Cleveland. Headquarters will be maintained at the Wade Park Manor Hotel. The program is being arranged by Dr. Allan C. Barnes, professor of obstetrics and gynecology at Western Reserve University School of Medicine, Cleveland.——Dr. William E. Gilmore, Parkersburg, was recently elected president of the West Virginia chapter of the American College of Surgeons; Dr. Charles M. Scott, Bluefield, vice-president; and Dr. Kenneth G. MacDonald, Charleston, secretary-treasurer.

State Society Establishes Press Awards.—The council of the West Virginia State Medical Association is sponsoring the annual award of plaques for "the greatest contribution to community service" to two daily newspapers, which are members of the West Virginia Press Association. One award will be presented to a daily newspaper with a circulation in excess of 10,000 and the other to a daily with a circulation under that figure. Judges are to be selected by the West Virginia Press Association. The *West Virginia Medical Journal* is a member of the West Virginia Press Association.

WISCONSIN

Loevenhart Lectureship.—The Alpha Psi chapter of the Phi Delta Epsilon fraternity at the University of Wisconsin will hold its ninth annual Arthur S. Loevenhart Lectureship April 21. The guest speaker will be Dr. Louis N. Katz, director, department of cardiovascular research, Michael Reese Hospital, Chicago, who will discuss "Hormonal Regulation of Atherosclerosis."

Carey Memorial Lecture.—The eighth annual Eben J. Carey Memorial Lectureship, sponsored by the Marquette chapter of the Phi Delta Epsilon International Medical Fraternity will be given at 8:30 p. m., April 21, in the auditorium of the Marquette University School of Medicine, Milwaukee. Dr. Henry L. Bockus, chairman, department of medicine, University of Pennsylvania Graduate School of Medicine, Philadelphia, will consider "Present Status of Medical Management of Peptic Ulcer." Dr. Bockus is a past president of the American Gastroenterological Association.

Chest Physicians Meet in Milwaukee.—The Wisconsin chapter, American College of Chest Physicians, will meet May 1 at the Schroeder Hotel, Milwaukee. After a business luncheon, the following program will be presented:

Clinical Aspects of Pleurisy with Effusion. J. Arthur Myers, Minneapolis.
Prognosis of Bronchiectasis, Arthur M. Olsen, Rochester, Minn.
Appraisal of Routine Treatment of Bronchial Asthma, George L. Waldbott, Detroit.
Rheumatic Heart Disease is Preventable, Chester M. Kurtz, Madison.
Therapeutic Implications of Pulmonary Functions Studies, Albert H. Andrews Jr., Chicago.
Advantages of Routine Chest X-Ray Examination in a General Hospital, Abraham Melamed, Milwaukee.

Orthopedic Field Clinics.—The Bureau for Handicapped Children, state department of public instruction, announces the following schedule for orthopedic field clinics: La Crosse, April 19-22; Superior, April 27-28; Fond du Lac, May 11; Appleton, May 12-13; Chippewa Falls, May 19-20; Rhinelander, June 1-2; Lancaster, June 16; and Darlington, June 17. The clinics are conducted for persons under 21 years of age who come within the state's definition of a crippled child. It is preferred that referral be made by the family physician, but when this is not feasible, arrangements may be made by writing to the bureau. Forms for the purpose of referral should be requested from the bureau in advance of the clinic date. Inquiries should be addressed to the Bureau for Handicapped Children, 146 North, State Capitol, Madison 2.

GENERAL

Conference on Physical Education.—The 36th annual conference of the Eastern District Association of the American Association for Health, Physical Education and Recreation will be held April 17-20 at the Hotel Statler, Boston. Among the topics to be considered are "Audiovisual Aids," "College Health Instruction," "College and University Physical Education for Men," "School Health Services," "Recreational Therapy," "Elementary and Secondary School Health," "Public School Physical Education," and "Health Education, Adults." On Monday Dr. Dana L. Farnsworth, Cambridge, Mass., director of university health services, Harvard University, will discuss "Emotional Maturity Through Indirect Education."

Meeting of American Radium Society.—The 37th annual meeting of the American Radium Society will be held at the Shoreham Hotel, Washington, D. C., April 21-23. Dr. John E. Wirth, Pasadena, Calif., will deliver the presidential address Thursday afternoon, after which Dr. Franklin L. Payne, Philadelphia, will moderate a symposium on endometrial cancer. Wives and guests will be welcome at the informal dinner, 7 p. m., after which the Janeway Lecture will be delivered. Saturday morning will be devoted to (1) a symposium moderated by Dr. Cushman D. Haagensen, New York (Clinical Diagnosis and Pathological Aspects of Various Benign Lesions of the Breast and Their Relationship to the Development of Carcinoma of the Breast. Clinical Diagnosis of Carcinoma of the Breast) and (2) a panel discussion by clinicians, radiologists, and specialists in pathology and endocrinology.

Meeting on Geriatrics.—The 12th annual meeting of the American Geriatrics Society will convene at the Hotel Roosevelt, New York, April 21-22, under the presidency of Dr. Norris J. Heckel, Chicago. The following panels have been scheduled: Diabetes in the Aged (moderator, Dr. Laurance W. Kinsell, Oakland, Calif.); Cardiac and Circulatory Diseases (moderator, Dr. Charles T. Stone, Galveston, Texas); Osteoporosis (moderator, Dr. Ephraim Shorr, New York); and Cancer (moderator, Dr. Cornelius P. Rhoads, New York). The annual dinner, Friday, 8 p. m., will be preceded by cocktails (sponsored by the Schering Corporation). Tickets for the dinner may be obtained from the American Geriatrics Society, Wakefield, R. I., or at the regis-

tration desk ($10, including gratuities). A special invitation has been extended to all fellows and members of the society to visit the William I. Sirovich Day Center, 203 Second Ave. at 13th St., Saturday morning. The center sponsors a cultural and educational program for older people.

Gastroenterologists Meet in Memphis.—The American College of Gastroenterology will hold its Southern Regional Meeting April 24 at the Hotel Peabody, Memphis, Tenn. Members of the medical profession are cordially invited. Dr. Lynn A. Ferguson, Grand Rapids, Mich., president, American College of Gastroenterology, will preside over the first session, 2-3:30 p. m., when the following papers will be presented:

Status of Liver Biopsy, Nathaniel E. Rossett, Memphis, Tenn.
Diaphragmatic Hernia, Samuel L. Stephenson Jr. and Ernest L. Posey Jr., Jackson, Miss.
Treatment of Peptic Ulcer with Unrestricted Diet, Edward A. Marshall, Cleveland.

John E. Cox, Memphis, Tenn., general chairman, Southern Region, American College of Gastroenterology, will preside at the closing session, when the following program will be presented at 3:40 p. m.:

Achalasia of the Cricopharyngeal Sphincter, James T. Nix, New Orleans.
Functional Causes of Dysphagia, John M. McMahon, Bessemer, Ala.
Carcinoma of the Pancreas with Some Unusual Symptoms, Lucius C. Sanders, Memphis.

Public Health Meeting in Arizona.—The western branch of the American Public Health Association will hold its 22nd annual meeting April 19-22 at the Hotel Westward Ho, Phoenix. The luncheon meeting, Tuesday, will be preceded by "The Program of WHO" by Dr. Miguel E. Bustamante, secretary general, Pan American Sanitary Bureau, World Health Organization, and will be followed by a symposium on public relations. On Wednesday morning the epidemiology section will present a discussion on infectious hepatitis from the point of view of the physician, public health nurse, and engineer-sanitarian; the Salk vaccine trials; and smog. The venereal disease control section has scheduled an all day panel discussion on case finding and venereal disease control for Wednesday. The general session, Thursday morning, will open with "Public Health in Civil Defense" by Dr. John M. Whitney, director, Health Office, Federal Civil Defense Administration, Battle Creek, Mich. At 10 a. m. there will be a chronic disease symposium. At 1:30 p. m. Dr. James R. Shaw, chief, Branch of Public Health, Bureau of Indian Affairs, Washington, D. C., will discuss "Transition of Health Services of Indian Service to Public Health Service," after which the John J. Sippy Memorial Award will be presented.

National Air Pollution Symposium.—The third National Air Pollution Symposium ("Protecting Our Air Resource") will be held at the Huntington-Sheraton Hotel, Pasadena, Calif., April 18-20, under the sponsorship of the Stanford Research Institute in cooperation with the California Institute of Technology, University of California, University of Southern California, Air Pollution Control Association, and the Air Pollution Foundation. On Monday the luncheon address will be delivered by Harold C. Urey, Ph.D., professor of chemistry, Institute for Nuclear Studies, University of Chicago. On Tuesday the luncheon address will be given by Justin M. Andrews, Sc.D., Atlanta, Ga., assistant surgeon general, United States Department of Public Health, whose topic will be "Epidemiological Approach to the Problem of Air Pollution." The Tuesday session will end with a panel discussion outlining the state of knowledge of physiological response of animals to air pollution, in which Philip Drinker, LL.D., Boston, Norton Nelson, Ph.D., New York, and Dr. Harley L. Motley, Los Angeles, will be the collaborators. The 24 papers to be presented will include considerations of the general aspects of air pollution, physiological effects on plants and animals, analytical techniques and instrumentation, and legal aspects of air pollution.

Meeting on Rehabilitation.—The eastern section of the American Congress of Physical Medicine and Rehabilitation will hold a session April 23 at the Hotel Lenox, corner Boylston and Exeter streets, Boston, in conjunction with the New England Society of Physical Medicine, the Section on Physical Medicine of the Medical Society of the County of Kings, the New Jersey Society of Physical Medicine, the New York Society of Physical Medicine, and the Pennsylvania Academy of Physical Medicine and Rehabilitation. The following presentations will be made from 9:30 to 11 a. m.:

Hans J. A. Behrend, New York, Recent Views on Ultrasonic Therapy.
Alvin B. C. Knudson, Washington, D. C., Physical Medicine and Rehabilitation: Changing Perspectives and Expanding Potential.
Harold Lefkoe and Albert A. Martucci, Philadelphia, Malingering and Rehabilitation.
Jacob Meislin, Montrose, N. Y., Special Problems Confronting the Physiatrist in Treatment of Physical Conditions in Psychiatric Patients.

There will be a preluncheon panel on hands, and the afternoon session will be devoted to panels on (1) backs and (2) the place of the general practitioner in physical medicine and rehabilitation. Dinner at 7 p. m. will precede the evening session. Physicians, other professional personnel, and their guests are welcome.

Dermatologists Meet in Florida.—The American Dermatological Association has scheduled its 75th annual meeting for April 18-21 at the Belleview-Biltmore, Belleair, Fla. The scientific sessions will open Monday at 10:30 a. m. with the presidential address of Dr. Richard S. Weiss, St. Louis, after which the American Dermatological Association medalist for 1955 will be introduced. "Eccrine Spiradenoma: The Painful Adenoma of Eccrine Sweat Gland" will be presented by Drs. David W. Kersting, Chicago, and Elson B. Helwig, Washington, D. C. The Tuesday session will open with the presentation of "Cortisone and Corticotropin Treatment of Pemphigus—Experience with Twenty-Eight Cases Over a Period of Five Years" by Dr. Carl T. Nelson, New York. "Histochemical Evidence for Human Eccrine Sweat Duct Activity" is the subject of the opening address Wednesday morning by Dr. Walter C. Lobitz Jr., Hanover, N. H. "An Evaluation of the Etiology of Otitis Externa (With Additional Studies)" will be presented by Dr. Stuart C. Way, San Francisco, Thursday, 8:45 a. m. The presidents' party in honor of Dr. and Mrs. Weiss and Dr. and Mrs. Clark W. Finnerud, Chicago, is scheduled for Monday at 6:30 p. m. The association golf tournament for men and women will be held Wednesday afternoon, and the trophies will be awarded Thursday at 11:30 a. m.

Meeting of Neurologists.—The American Academy of Neurology will hold its seventh annual meeting at the Shamrock Hotel, Houston, Texas, April 25-30. A symposium on "What We Need to Know About Central Nervous System Vascular Disease" is scheduled for Wednesday, 8:30 p. m. Dr. Seymour S. Kety, Bethesda, Md., will speak on physiology; Dr. Miller Fisher, Montreal, Canada, on pathology; Dr. Clark H. Millikan, Rochester, Minn., on neurology; and Dr. Irvine H. Page, Cleveland, on internal medicine. Dr. Adolph L. Sahs, Iowa City, will present the summary. The presidential address, "The Dimensions of Neurology," will be delivered Thursday at 2 p. m. by Dr. Howard D. J. Fabing, Cincinnati. The sessions will close Friday afternoon with the following reports of clinical entities:

Cerebral Schistosomiasis: Clinical Pathologic Correlations of 22 Cases and Follow-Up Data.
Dystonia Associated with Generalized Muscular Atrophy: A Syndrome Noted in Two Patients.
Neurologic Symptoms with Osteoid Osteoma.
Spontaneous Bilateral Labyrinthine Deficit.
Mobius's Syndrome—Congenital Oculofacial Paralysis.
Protrusion of Thoracic Intervertebral Disks.
Spielmeyer-Vogt Disease.
Clinical and Pathologic Study of a Family with Hereditary Cerebellar Ataxia.
Light Induced Clinical and Electroencephalographic Abnormalities as Manifestations of Genetically Determined Cerebral Disease.

Industrial Health Conference.—The annual Industrial Health Conference will be held at the Memorial Auditorium, Buffalo, April 23-29. The component organizations of the conference are the Industrial Medical Association, American Conference of Governmental Industrial Hygienists, American Industrial Hygiene Association, American Association of Industrial Dentists, and the American Association of Industrial Nurses. The session of the Industrial Medical Association will be preceded by clinical teaching sessions Tuesday morning at the University of Buffalo School of Medicine, 3435 Main St. Dr. Kieffer D. Davis, Bartlesville, Okla., will preside over the afternoon session, which will open with the Sappington Memorial Lecture. At 3:10

p. m. Dr. Arthur J. Vorwald, Detroit, will moderate a panel discussion, "Criteria of Industrial Pulmonary Disease and the Evaluation of Resulting Disability." "Living Situations in Human Relations" will be the topic for discussion at the evening session at the Hotel Statler. The annual banquet will be held Wednesday, 6:30 p. m. On Thursday at 2 p. m. the medical section will present a symposium, "Cardiac in Industry," and the surgical section will have a trauma conference. The American Industrial Hygiene Association has scheduled industrial hygiene tours for Monday afternoon. Its annual banquet will be held Wednesday, 6:30 p. m., after which Dr. James H. Sterner, Eastman Kodak Company, Rochester, N. Y., will deliver the Donald E. Cummings Memorial Lecture. On Wednesday at 1:30 p. m. there will be a joint meeting of the members of the American Association of Industrial Nurses, the Industrial Medical Association, the American Industrial Hygiene Association, and the American Association of Industrial Dentists. "Evaluation of Audiometric and Hearing Standards in Industry" will be presented by Dr. Charles I. Barron, medical director, and Dr. Andrew A. Love, otologist, Lockheed Aircraft Corporation, Burbank, Calif. "The Nurse in Audiometry" will be the topic of Miss Anna Bakker, R.N., Eastman Kodak Company, Rochester, N. Y.

FOREIGN

Surgeons Meet in Geneva.—The 20th anniversary of the International College of Surgeons will be observed at a meeting May 23-26 in Geneva, Switzerland, where the college was founded by Dr. Max Thorek, Chicago. The program includes presentations by 28 physicians from the United States. The entertainment program will include a symphony concert conducted by Ernest Ansermet, a formal banquet, a cruise on Lake Geneva, and a reception by the Geneva state and city authorities.

Seminars in Pathology.—The American Medical Society of Vienna announces the following seminar congresses in pathology by the medical faculty of the University of Vienna:

May 12-13, Histological Pathology.
July 14-15, Gross Pathology.
Sept. 15-16, Surgical Pathology.
Oct. 13-14, Cancer.

The faculty will also present the following seminar congresses in radiology:

May 26-28, Diagnosis with Selected Practical Demonstrations.
July 28-30, Therapy with Selected Practical Demonstrations.
Sept. 28-30, General Radiology with Selected Practical Demonstrations.
Nov. 24-26, Practical Demonstrations in Diagnosis and Therapy.

Details may be obtained from the American Medical Society of Vienna, I. Vienna, Universitaetsstrasse 11. Cable: "Ammedic" Vienna.

DEATHS IN OTHER COUNTRIES

Sir Alexander Fleming, discoverer of penicillin, died of heart disease at his home, London, England, March 11, aged 73. Sir Alexander was awarded the Nobel Prize for Medicine in 1945, sharing it with Sir Howard Florey and Dr. Ernst Boris Chain, Oxford researchers who had isolated penicillin. Until last November he was director of the Wright-Fleming Institute of Microbiology at St. Mary's Hospital, the medical school of which he had entered in 1902. Dr. Fleming was assistant bacteriologist at St. Mary's from 1906 to 1919, when he became assistant director of the inoculation department (later renamed the Wright-Fleming Institute of Microbiology). From 1911 to 1919 he was also pathologist to the London Lock Hospitals and in 1920 was appointed lecturer in bacteriology to the medical school of St. Mary's. Eight years later he was named professor, and 20 years thereafter retired as emeritus from that position. During the first World War he served in the R. A. M. C. His wartime publications included papers on the bacteriology of septic wounds, blood transfusion, and influenza; and later he contributed to the "Medical History of the War." After the war he returned to St. Mary's. In 1919 and in 1924 he was Hunterian Professor at the Royal College of Surgeons, and in 1928 delivered at the college the Arris and Gale Lectures on Lysozyme.

CORRECTIONS

Wrong Pioneer Cited.—In the guest editorial "A Renaissance of the Control of Diabetes" (Dec. 25, 1954, page 1584) Professor Fanconi of Switzerland is mentioned in the first and fourth paragraphs, but in both instances Professor Cantani of Italy was meant.

Food Faddism.—In the editorial "Common Sense vs. Food Faddism," which appeared on page 514 of the Feb. 5 issue of THE JOURNAL, some readers gained the impression that wheat germ is an uneconomical food. Wheat germ is not a complete protein, and everyone who eats milled wheat would do well to replace the wheat germ removed, about 1 tablespoonful a day, in their diet. Larger amounts are quite acceptable, and, in addition to protein, wheat germ is a rich source of vitamins and minerals —at bargain prices.

MEETINGS

AMERICAN MEDICAL ASSOCIATION: Dr. George F. Lull, 535 North Dearborn St., Chicago 10, Secretary.

1955 Annual Meeting, Atlantic City, N. J., June 6-10.
1955 Clinical Meeting, Boston, Nov. 29-Dec. 2.

1956 Annual Meeting, Chicago, June 11-15.
1956 Clinical Meeting, Seattle, Nov. 27-30.

1957 Annual Meeting, New York, June 3-7.

ALABAMA, MEDICAL ASSOCIATION OF THE STATE OF, Whitley Hotel, Montgomery, April 21-23. Dr. Douglas L. Cannon, 537 Dexter Ave., Montgomery, Secretary.

AMERICAN ACADEMY OF NEUROLOGY, Shamrock Hotel, Houston, Tex., April 28-30. Dr. Alexander T. Ross, Indiana University Medical Center, Indianapolis 7, Secretary.

AMERICAN ACADEMY OF TUBERCULOSIS PHYSICIANS, Ritz-Carlton Hotel, Atlantic City, N. J., June 4. Dr. Oscar S. Levin, P. O. Box 7011, Denver, Secretary.

AMERICAN ASSOCIATION FOR CLEFT PALATE REHABILITATION, Statler Hotel, Boston, May 13-14. Dr. Jack Matthews, 1617 Cathedral of Learning, University of Pittsburgh, Pittsburgh 13, Secretary.

AMERICAN ASSOCIATION OF GENITO-URINARY SURGEONS, Monterey Lodge, Monterey, Calif., May 22-25. Dr. John A. Taylor, 2 East 54th St., New York 22, Secretary.

AMERICAN ASSOCIATION FOR HEALTH, PHYSICAL EDUCATION AND RECREATION, Hotel Statler, Boston, April 17-20. Mr. William F. Meredith, Dept. of Physical Education, University of Pennsylvania, Philadelphia 4, Secretary.

AMERICAN ASSOCIATION OF THE HISTORY OF MEDICINE, Hotel Park Shelton, Detroit, May 12-14. Dr. Samuel X. Radbill, 7043 Elmwood Ave., Philadelphia 42, Secretary.

AMERICAN ASSOCIATION ON MENTAL DEFICIENCY, Statler Hotel, Detroit, May 24-28. Dr. Lloyd N. Yepsen, New Lisbon, N. J., Secretary.

AMERICAN ASSOCIATION FOR THE STUDY OF NEOPLASTIC DISEASES, Lord Baltimore Hotel, Baltimore, May 5-7. Dr. Bruce H. Sisler, P. O. Box 268, Gatlinburg, Tenn., Secretary.

AMERICAN ASSOCIATION FOR THORACIC SURGERY, Chalfonte-Haddon Hall, Atlantic City, N. J., April 24-26. Dr. Paul C. Samson, 3959 Happy Valley Rd., Lafayette, Calif., Secretary.

AMERICAN COLLEGE OF ALLERGISTS, Morrison Hotel, Chicago, April 25-30. Dr. Fred W. Wittich, 401 LaSalle Med. Bldg., Minneapolis 2, Secretary.

AMERICAN COLLEGE OF ANGIOLOGY, Brighton Hotel, Atlantic City, N. J., June 4. Dr. Hugh Murphy, 151 East 83d St., New York, Secretary.

AMERICAN COLLEGE OF CARDIOLOGY, Hotel Biltmore, New York, May 19-21. Dr. Philip Reichert, 140 West 57th St., New York 19, Secretary.

AMERICAN COLLEGE OF CHEST PHYSICIANS, Atlantic City, N. J., June 2-5. Mr. Murray Kornfeld, 112 East Chesnut St., Chicago 11, Executive Director.

AMERICAN COLLEGE OF PHYSICIANS, Benjamin Franklin and Bellevue-Stratford Hotels, Philadelphia, April 25-29. Mr. E. R. Loveland, 4200 Pine St., Philadelphia 4, Executive Secretary.

AMERICAN DERMATOLOGICAL ASSOCIATION, Bellevue-Biltmore Hotel, Belleair, Fla., April 17-21. Dr. J. Lamar Callaway, Duke Hospital, Durham, N. C., Secretary.

AMERICAN DIABETES ASSOCIATION, Chalfonte-Haddon Hall, Atlantic City N. J., June 4-5. Dr. John A. Reed, 1 East 45th St., New York 17, Secretary

AMERICAN ELECTROENCEPHALOGRAPHIC SOCIETY, Palmer House, Chicago, June 10-12. Dr. W. T. Liberson, EEG Research Laboratory, Veterans Administration Hospital, Northampton, Mass., Secretary.

AMERICAN FEDERATION FOR CLINICAL RESEARCH, Haddon Hall, Atlantic City, N. J., May 1. Dr. Lawrence E. Hinkle Jr., 525 East 68th St., New York 21, Secretary.

AMERICAN GASTROENTEROLOGICAL ASSOCIATION, Claridge Hotel, Atlantic City, N. J., June 3-4. Dr. H. Marvin Pollard, University Hospital, Ann Arbor, Mich., Secretary.

AMERICAN GERIATRICS SOCIETY, Hotel Roosevelt, New York, April 21-22. Dr. Malford W. Thewlis, 25 Mechanic St., Wakefield, R. I., Secretary.

AMERICAN GOITER ASSOCIATION, Skirvin Hotel, Oklahoma City, April 28-30. Dr. John C. McClintock, 149½ Washington Ave., Albany 10, N. Y., Secretary.

AMERICAN GYNECOLOGICAL SOCIETY, Chateau Frontenac, Quebec, Canada, May 23-25. Dr. John I. Brewer, 104 S. Michigan Blvd., Chicago 3, Secretary.

AMERICAN MEDICAL WOMEN'S ASSOCIATION, Hotel Dennis, Atlantic City, N. J., June 2-5. Miss L. T. Majally, 1790 Broadway, New York 19, Executive Secretary.

AMERICAN OPHTHALMOLOGICAL SOCIETY, Greenbrier Hotel, White Sulphur Springs, W. Va., June 2-4. Dr. Maynard C. Wheeler, 30 West 59th St., New York 19, Secretary.

AMERICAN PROCTOLOGIC SOCIETY, Hotel Statler, New York, June 1-4. Dr. Karl Zimmerman, 3500 Fifth Ave., Pittsburgh 13, Secretary

AMERICAN PSYCHIATRIC ASSOCIATION, Traymore and Claridge Hotels, Atlantic City, N. J., May 9-13. Dr. William Malamud, 80 East Concord St., Boston 18, Secretary.

AMERICAN PSYCHOSOMATIC SOCIETY, Claridge Hotel, Atlantic City, N. J., May 4-5. Dr. Theodore Lidz, 333 Cedar St., New Haven 11, Conn., Secretary.

AMERICAN RADIUM SOCIETY, Shoreham Hotel, Washington, D. C., April 21-23. Dr. Robert E. Fricke, 102 Second Ave. S.W., Rochester, Minn., Secretary.

AMERICAN RHEUMATISM ASSOCIATION, Hotel Dennis, Atlantic City, N. J., June 3-4. Dr. William H. Kammerer, 33 East 61st St., New York 21, Secretary.

AMERICAN SOCIETY FOR CLINICAL INVESTIGATION, Haddon Hall, Atlantic City, N. J., May 2. Dr. J. D. Meyers, 622 West 168th St., New York 32, Secretary.

AMERICAN SOCIETY OF MAXILLOFACIAL SURGEONS, Brown Hotel, Louisville, Ky., May 9-11. Dr. John A. Drummond, 1414 Drummond St., Montreal, Canada, Secretary

AMERICAN SOCIETY FOR THE STUDY OF STERILITY, Ritz-Carlton Hotel, Atlantic City, N. J., June 3-5. Dr. Herbert H. Thomas, 920 South 19th St., Birmingham, Ala., Secretary.

AMERICAN SURGICAL ASSOCIATION, The Warwick, Philadelphia, April 27-29. Dr. R. Kennedy Gilchrist, 59 East Madison St., Chicago 3, Secretary.

AMERICAN THERAPEUTIC SOCIETY, Shelburne Hotel, Atlantic City, N. J., June 2-5. Dr. Oscar B. Hunter Jr., 915 Nineteenth St. N.W., Washington 6, D. C., Secretary.

AMERICAN TRUDEAU SOCIETY, Schroeder Hotel, Milwaukee, May 23-27. Dr. W. G. Childress, 1790 Broadway, New York 19, Secretary.

AMERICAN UROLOGICAL ASSOCIATION, Hotel Biltmore, Los Angeles, May 16-19. Dr. Charles H. deT. Shivers, 121 South Illinois Ave., Atlantic City, N. J., Secretary.

AMERICAN VENEREAL DISEASE ASSOCIATION, Washington, D. C., Apr. 28-29. Dr. John C. Hume, 615 N. Wolfe St., Baltimore 5, Secretary.

ARIZONA MEDICAL ASSOCIATION, El Conquistador, Tucson, May 4-7. Dr. Dermont W. Melick, 401 Security Building, Phoenix, Secretary.

ARKANSAS MEDICAL SOCIETY, Arlington Hotel, Hot Springs, May 29-June 1. Dr. J. J. Monfort, 215 Kelley Bldg., Fort Smith, Secretary.

ASSOCIATION OF AMERICAN PHYSICIANS, Chalfonte-Haddon Hall, Atlantic City, N. J., May 3-4. Dr. W. Barry Wood Jr., 600 S. Kingshighway Blvd., St. Louis 10, Secretary.

ASSOCIATION FOR RESEARCH IN OPHTHALMOLOGY, Dennis Hotel, Atlantic City, N. J., June 7-9. Dr. Lorand V. Johnson, 10515 Carnegie Ave., Cleveland 6, Secretary.

CALIFORNIA MEDICAL ASSOCIATION, Palace Hotel, San Francisco, May 1-4. Mr. John Hunton, 450 Sutter St., San Francisco 8, Executive Secretary.

CATHOLIC HOSPITAL ASSOCIATION OF THE U. S. AND CANADA, Kiel Auditorium, St. Louis, May 16-19. Mr. M. R. Kneifl, 1438 South Grand Blvd., St. Louis 4, Executive Secretary.

CONNECTICUT STATE MEDICAL SOCIETY, Stratford High School, Stratford, April 26-28. Dr. Creighton Barker, 160 St. Roman St., New Haven, Executive Secretary

EASTERN STATES HEALTH EDUCATION CONFERENCE, New York Academy of Medicine, New York, April 21-22. Dr. Iago Galdston, 2 East 103rd St., New York 29, Secretary.

GEORGIA, MEDICAL ASSOCIATION OF, Bon Air Hotel, Augusta, May 1-4. Mr. Milton D. Kreuger, 875 West Peachtree St., Atlanta, Executive Secretary.

HAWAII MEDICAL ASSOCIATION, Honolulu, May 5-8. Dr. Samuel L. Yee, 510 South Beretania St., Honolulu 13, Secretary.

ILLINOIS STATE MEDICAL SOCIETY, Hotel Sherman, Chicago, May 17-20. Dr. Harold M. Camp, 224 South Main St., Monmouth, Secretary.

INDUSTRIAL MEDICAL ASSOCIATION, Buffalo, N. Y., April 23-29. Dr. Glenn Gardiner, Inland Steel Co., East Chicago, Ind., Secretary.

IOWA STATE MEDICAL SOCIETY, Veterans' Memorial Auditorium, Des Moines, April 24-27. Dr. R. F. Birge, 529 36th St., Des Moines 12, Secretary.

KANSAS MEDICAL SOCIETY, Baker Hotel, Hutchinson, May 1-5. Dr. J. A. Butin, 315 West Fourth St., Topeka, Secretary.

LOUISIANA STATE MEDICAL SOCIETY, Roosevelt Hotel, New Orleans, May 2-4. Dr. C. Grenes Cole, 1430 Tulane Ave., New Orleans 12, Secretary.

MARYLAND, MEDICAL AND CHIRURGICAL FACULTY OF THE STATE OF, Baltimore, April 21-23. Dr. Everett S. Diggs, 1211 Cathedral St., Baltimore, Secretary.

MASSACHUSETTS MEDICAL SOCIETY, Hotel Statler, Boston, May 17-19. Dr. Robert W. Buck, 22 Fenway, Boston 15, Secretary.

MEDICAL LIBRARY ASSOCIATION, Hotel Schroeder, Milwaukee, May 17-20. Miss Esther Judkins, Rockefeller Institute, 66th St. at York Ave., New York 21, Secretary.

MEDICAL SOCIETY EXECUTIVES CONFERENCE, Ritz-Carlton Hotel, Atlantic City, N. J., June 4. Mr. W. H. Bartleson, 3036 Gillham Road, Kansas City 8, Mo., Secretary.

MIDWEST REGIONAL CONFERENCE, AMERICAN PSYCHIATRIC ASSOCIATION, Nebraska Psychiatric Institute, Omaha, Apr. 22-23. Dr. Harold R. Martin, Nebraska Psychiatric Institute, Omaha, Chairman, Program Committee.

MINNESOTA STATE MEDICAL ASSOCIATION, Hotel Radisson, Minneapolis, May 23-25. Mr. R. R. Rosell, Lowry Medical Arts Bldg., St. Paul 2, Executive Secretary.

MISSISSIPPI STATE MEDICAL ASSOCIATION, Hotel Buena Vista, Biloxi, May 10-12. Mr. Rowland B. Kennedy, 860 Milner Bldg., Jackson, Executive Secretary.

NATIONAL TUBERCULOSIS ASSOCIATION, Hotel Schroeder, Milwaukee, May 23-27. Dr. James E. Perkins, 1790 Broadway, New York 19, Managing Director.

NEBRASKA STATE MEDICAL ASSOCIATION, Hotel Paxton, Omaha, May 16-19. Dr. R. B. Adams, 1315 Sharp Bldg., Lincoln, Secretary.

NEW JERSEY, MEDICAL SOCIETY OF, Ambassador Hotel, Atlantic City, April 17-20. Dr. Marcus H. Greifinger, 315 West State St., Trenton 8, Secretary.

NEW MEXICO MEDICAL SOCIETY, Hilton Hotel, Albuquerque, May 4-6. Mr. Ralph R. Marshall, 223 First National Bank Bldg., Albuquerque, Executive Secretary.

NEW YORK, MEDICAL SOCIETY OF THE STATE OF, Hotel Statler, Buffalo, May 9-13. Dr. Walter P. Anderton, 386 Fourth Avenue, New York 16, Secretary.

NORTH AMERICAN CHAPTER, INTERNATIONAL SOCIETY OF ANGIOLOGY, Chalfonte-Haddon Hall, Atlantic City, N. J., June 4. Dr. Henry Haimovici, 105 East 90th St., New York 28, Secretary.

NORTH CAROLINA, MEDICAL SOCIETY OF THE STATE OF, Hotel Carolina, Pinehurst, May 2-4. Mr. James T. Barnes, 203 Capitol Club Building, Raleigh, Executive Secretary.

NORTH DAKOTA STATE MEDICAL ASSOCIATION, Hotel Prince, Bismarck, April 30-May 3. Dr. E. H. Boerth, Box 1198, Bismarck, Secretary.

OHIO STATE MEDICAL ASSOCIATION, Netherland-Plaza Hotel, Cincinnati, April 19-21. Mr. Charles S. Nelson, 79 E. State St., Columbus 15, Executive Secretary.

OKLAHOMA STATE MEDICAL ASSOCIATION, Mayo Hotel, Tulsa, May 8-11. Mr. R. H. Graham, 1227 Classen Drive, Oklahoma City, Executive Secretary.

PACIFIC NORTHWEST SOCIETY OF PLASTIC AND RECONSTRUCTIVE SURGEONS, Spokane, Wash., May 21. Dr. E. E. Banfield, Medical Arts Bldg., Tacoma 2. Washington, Secretary.

RHODE ISLAND MEDICAL SOCIETY, Rhode Island Medical Society Library, Providence, May 4-5. Dr. Thomas Perry Jr., 106 Francis St., Providence 3, Secretary.

ROCKY MOUNTAIN MEDICAL CONFERENCE, Hilton Hotel, Albuquerque, N. Mex., May 4-6. Mr. Ralph R. Marshall, 223-224 First National Bank, Albuquerque, N. Mex., Secretary.

SECTIONAL MEETINGS, AMERICAN COLLEGE OF SURGEONS:

IDAHO, Sun Valley, Sun Valley Lodge, April 18-20. Dr. James H. Hawley, 105 North 8th St., Boise, Chairman.

MANITOBA, Winnipeg, The Fort Garry, April 25-26. Dr. Paul H. T. Thorlakson, Winnipeg Clinic, Winnipeg, Manitoba, Chairman.

SOCIETY OF AMERICAN BACTERIOLOGISTS, Statler Hotel, New York, May 8-13. Dr. John Hays Bailey, Sterling Winthrop Research Institute, Rensselaer, N. Y., Secretary.

SOCIETY OF BIOLOGICAL PSYCHIATRY, Palmer House, Chicago, June 11-12. Dr. George N. Thompson, 2010 Wilshire Blvd., Los Angeles 5, Secretary.

SOCIETY FOR INVESTIGATIVE DERMATOLOGY, Ritz-Carlton Hotel, Atlantic City, N. J., June 4-5. Dr. Herman Beerman, 255 South 17th St., Philadelphia 3, Secretary.

SOCIETY FOR VASCULAR SURGERY, Atlantic City, N. J., June 5. Dr. George D. Lilly, 333 Ingraham Bldg., Miami 32, Fla., Secretary.

SOUTH CAROLINA MEDICAL ASSOCIATION, Francis Marion Hotel, Charleston, May 10-12. Dr. Robert Wilson, 165 Rutledge Ave., Charleston, Secretary.

SOUTH DAKOTA STATE MEDICAL ASSOCIATION, Lawler Hotel, Mitchell, May 21-24. Dr. G. I. W. Cottam, 300 First National Bank Bldg., Sioux Falls, Secretary.

SOUTHERN BRANCH, AMERICAN PUBLIC HEALTH ASSOCIATION, New Orleans, May 11-13. Dr. Frank M. Hall, P. O. Box 491, Gainesville, Fla., Secretary.

STUDENT AMERICAN MEDICAL ASSOCIATION, Sherman Hotel, Chicago, May 6-8. Mr. Russell F. Staudacher, 510 N. Dearborn St., Chicago 10, Executive Secretary.

TEXAS MEDICAL ASSOCIATION, Texas Hotel, Fort Worth, April 24-27. Dr. J. M. Travis Sr., 1801 North Lamar Blvd., Austin, Secretary.

THE ENDOCRINE SOCIETY, Chalfonte-Haddon Hall, Atlantic City, N. J., June 2-4. Dr. Henry H. Turner, 1200 N. Walker St., Oklahoma City 3, Secretary.

UNITED STATES-MEXICO BORDER PUBLIC HEALTH ASSOCIATION, Hotel del Bosque, Mexico, D. F., May 6-9. Dr. Sidney B. Clark, 204 U. S. Court, El Paso, Texas, Secretary.

WESTERN BRANCH, AMERICAN PUBLIC HEALTH ASSOCIATION, Phoenix, Ariz., April 19-22. Mrs. L. Amy Darter, Division of Laboratories, State Dept. of Public Health, Berkeley, Calif., Secretary.

WESTERN INDUSTRIAL MEDICAL ASSOCIATION, Sir Francis Drake Hotel, San Francisco, April 30. Dr. Edward J. Zaik, 740 S. Olive St., Room 320, Los Angeles 14, Secretary.

WISCONSIN, STATE MEDICAL SOCIETY OF, Hotel Schroeder, Milwaukee, May 3-5. Mr. Charles H. Crownhart, 704 East Gorham St., Madison 3, Secretary.

WOMAN'S AUXILIARY TO THE AMERICAN MEDICAL ASSOCIATION, Haddon Hall, Atlantic City, N. J., June 6-10. Miss Margaret Wolfe, 535 N. Dearborn St., Chicago 10, Executive Secretary.

WYOMING STATE MEDICAL SOCIETY, Hotel Connor, Laramie, June 5-7. Mr. Arthur R. Abbey, Box 2036, Cheyenne, Executive Secretary.

FOREIGN AND INTERNATIONAL

AUSTRALASIAN MEDICAL CONGRESS, Sydney, N.S.W., Australia, Aug. 20-27. For information write: Federal Council of the B.M.A. in Australia, 135 Macquaire St., Syndey, N.S.W., Australia.

BRITISH MEDICAL ASSOCIATION, Representative Meeting, London, England, June 1-4. Dr. A. Macrae, B.M.A. House, Tavistock Square, London, W.C.1, England, Secretary.

CANADIAN AND BRITISH MEDICAL ASSOCIATIONS, Joint Meeting, Toronto, Canada, June 20-22. Dr. Arthur D. Kelly, 244 St. George St., Toronto, Canada, General Secretary.

COMMONWEALTH HEALTH AND TUBERCULOSIS CONFERENCE, Royal Festival Hall, London, England, June 21-25. Mr. J. H. Harley Williams, Tavistock House North, Tavistock Square, London, W.C.1, England, Secretary General.

CONGRESS OF INTERNATIONAL ASSOCIATION OF APPLIED PSYCHOLOGY, London, England, July 18-23. Dr. C. B. Frisby, National Institute of Industrial Psychology, 14 Welbeck St., London, W.1, England, President.

CONGRESS OF INTERNATIONAL ASSOCIATION OF PSYCHOTECHNOLOGY, London, England, July 18-23. For information write: Dr. C. B. Frisby, Director, National Institute of Industrial Psychology, 14 Welbeck St., London, W.1, England.

CONGRESS OF THE INTERNATIONAL ASSOCIATION FOR THE STUDY OF THE BRONCHI, Stockholm, Sweden, June 18-19. For information write: Dr. J. M. Lemoine, 187 boulevard St. Germain, Paris 7°, France.

CONGRESS OF INTERNATIONAL DIABETES FEDERATION, Cambridge, England, July 4-8. Mr. James G. L. Jackson, 152 Harley St., London, W.1, England, Executive Secretary General.

CONGRESS OF INTERNATIONAL SOCIETY OF SURGERY, Copenhagen, Denmark, July 23-29. Dr. L. Dejardin, 141 rue Belliard, Brussels, Belgium, General Secretary.

EUROPEAN CONGRESS ON RHEUMATISM, Scheveningen, The Hague, Netherlands, June 13-17. Dr. H. van Swaay, Pieter Bothstraat 12, The Hague, Netherlands, Secretary.

HEALTH CONGRESS OF THE ROYAL SANITARY INSTITUTE, Bournemouth, England, April 26-29. Mr. P. Arthur Wells, Royal Sanitary Institute, 90 Buckingham Palace Road, London, S.W.1, England, Secretary.

INTER-AMERICAN CONGRESS OF RADIOLOGY, Shoreham Hotel, Washington, D. C., U. S. A., April 24-29. Dr. Eugene P. Pendergrass, 3400 Spruce St., Philadelphia 4, Pa., U. S. A., Secretary General.

INTERNATIONAL ANATOMICAL CONGRESS, Paris, France, July 25-30. Prof. Gaston Cordier, 45, rue des Saints-Pères, Paris 6°, France, Secretary General.

INTERNATIONAL CONGRESS OF ACUPUNCTURE, Paris, France, May 14-17. Dr. J. Gillet, Avenue Franklin D. Roosevelt, 8/111, Paris 8°, France, Secretary.

INTERNATIONAL CONGRESS OF ALLERGOLOGY, Rio de Janeiro, Brazil, S. A., Nov. 6-13. Dr. Bernard N. Halpern, 197 boulevard St. Germain, Paris 7°, France, Secretary General.

INTERNATIONAL CONGRESS OF ANGIOLOGY AND HISTOPATHOLOGY, Fribourg, Switzerland, Sept. 2-5. For information write: Dr. Gerson, 4 rue Pasquier, Paris 8°, France.

INTERNATIONAL CONGRESS OF BIOCHEMISTRY, Brussels, Belgium, Aug. 1-6. Prof. C. Liebecq, 17 Place Delcour, Liège, Belgium, Secretary General.

INTERNATIONAL CONGRESS OF COMPARATIVE PATHOLOGY, Lausanne, Switzerland, May 26-31. Professor Hauduroy, 19 rue Cesar Roux, Lausanne, Switzerland, Secretary General.

INTERNATIONAL CONGRESS OF CRIMINOLOGY, London, England, Sept. 11-18 For information write: Dr. Carroll, 28 Weymouth St., London, W.1, England.

INTERNATIONAL CONGRESS OF EUROPEAN SOCIETY OF HAEMATOLOGY, Freiburg i,Br., Germany, Sept. 20-24. Prof. Dr. L. Heilmeyer, Hugstetter Strasse 55, Freiburg i,Br., Germany, Chairman.

INTERNATIONAL CONGRESS OF LIBRARIANSHIP AND DOCUMENTATION, Brussels, Belgium, Sept. 11-18. For information write: Dr. A. C. Breycha-Vauthier, Librarian, United Nations, Geneva, Switzerland.

INTERNATIONAL CONGRESS OF NEUROPATHOLOGY, London, England, Sept. 12-17. Dr. W. H. McMenemey, Maida Vale Hospital for Nervous Diseases, London, W.9, England, Secretary.

INTERNATIONAL CONGRESS OF PLASTIC SURGERY, Stockholm, Sweden, Aug. 1-4, and Uppsala, Sweden, Aug. 5. Dr. Tord Skoog, Uppsala, Sweden, General Secretary.

INTERNATIONAL CONGRESS ON URINARY LITHIASIS, Evian, France, Sept. 2-4. Mr. Rossollin-Grandville, Direction Cachet, Evian (Hte-Savoie), France, Secretary General.

INTERNATIONAL HOSPITAL CONGRESS, Lucerne, Switzerland, May 29-June 3. Capt. J. E. Stone, International Hospital Federation, 10 Old Jewry, London, E.C.2, England, Hon. Secretary.

INTERNATIONAL MEDICAL CONGRESS, Verona, Italy, Sept. 1-4. For information write: c/o Offices of the International Verona Fair, Piazza Bra., Verona, Italy.

INTERNATIONAL OFFICE OF DOCUMENTATION OF MILITARY MEDICINE, Istanbul, Turkey, Aug. 28-Sept. 1. Dr. J. Voncken, 79 rue Saint Laurent, Liege, Belgium, Secretary-General.

INTERNATIONAL SOCIETY FOR THE STUDY OF BIOLOGICAL RHYTHMS, Stockholm, Sweden, Sept. 15-17. For information write: Prof. Ture Petrén, Karplinska Institutet, Stockholm 60, Sweden.

INTERNATIONAL SURGICAL CONGRESS, Geneva, Switzerland, May 23-26. Dr. Max Thorek, 1516 Lake Shore Drive, Chicago, Illinois, U. S. A., Secretary General.

INTERNATIONAL SYNDICATE OF GYNECOLOGISTS AND OBSTETRICIANS, Meeting Hall of Medical Societies, Paris, France, June 27-28. Dr. Jacques Courtois, 1, rue Racine, Saint-Germain-en-Laye (S & O), France, Secretary General.

IRISH OPHTHALMOLOGICAL SOCIETY, Dublin, Ireland, May 12-14.

MIDDLE EAST MEDICAL ASSEMBLY, Campus of American University of Beirut, Beirut, Lebanon, April 22-24. Dr. John L. Wilson, American University of Beirut, Beirut, Lebanon, Chairman.

NEURORADIOLOGIC SYMPOSIUM, London, England, Sept. 13-17. Dr. R. D. Hoare, National Hospital, Queen Square, London, W.C.1, England, Secretary.

PAN AMERICAN CONGRESS OF OPHTHALMOLOGY, Santiago, Chile, S. A., Jan. 9-14, 1956. Dr. Rene Contardo, Huerfanos 930, Of. 74, Santiago, Chile, Secretary General.

PAN AMERICAN CONGRESS ON RHEUMATIC DISEASES, Rio de Janeiro and Sao Paulo, Brazil, S. A., Aug. 14-20. For information write: Dr. Waldemar Bianchi, 126 Avenida Franklin D. Roosevelt, Rio de Janeiro, Brazil, S. A.

VENEZUELAN CONGRESS OF MEDICAL SCIENCES, Caracas, Venezuela, S. A., Nov. 18-26. Dr. A. L. Briceno Rossi, Apartado 4412, Ofic. del Este, Caracas, Venezuela, S. A., Secretary General.

WORLD CONGRESS OF ANESTHESIOLOGISTS, Scheveningen, Netherlands, Sept. 5-10. For information write: Mr. W. A. Fentener van Vlissingen, Noord-Houdringelaan, 24, Bilthoven, Netherlands.

WORLD FEDERATION FOR MENTAL HEALTH, Istanbul, Turkey, Aug. 21. For information write: Miss E. M. Thornton, 19 Manchester St., London, W.1, England.

WORLD MEDICAL ASSOCIATION, Vienna, Austria, Sept. 20-26. Dr. Louis H. Bauer, 345 East 46th St., New York 17, N. Y., U. S. A., Secretary General.

EXAMINATIONS AND LICENSURE

BOARDS OF MEDICAL EXAMINERS

ALABAMA: *Examination.* Montgomery, June 21-23. Sec., Dr. D. G. Gill, 537 Dexter Ave., Montgomery 4.

ARKANSAS:* *Examination.* Little Rock, June 9-10. Sec., Dr. Joe Verser, Harrisburg.

CALIFORNIA: *Written.* San Francisco, June 20-23; Los Angeles, Aug. 22-25; and Sacramento, Oct. 17-20. *Oral and Clinical Examinations for Foreign Medical School Graduates.* San Francisco, June 19; Los Angeles, Aug. 21; and San Francisco, Nov. 13. *Oral Examination for Reciprocity Applications.* San Francisco, June 18; Los Angeles, Aug. 20; and San Francisco, Nov. 12. Sec., Dr. Louis E. Jones, Room 536, 1020 N Street, Sacramento.

COLORADO:* *Examination.* Denver, June 14-15. Final date for filing applications is May 13. Exec. Sec., Miss Beulah H. Hudgens, 831 Republic Bldg., Denver 2.

DELAWARE: *Examination.* Dover, July 12-14. *Endorsement.* Dover, July 21. Final date for filing applications is June 15. Sec., Dr. Joseph S. McDaniel, Dover.

DISTRICT OF COLUMBIA:* *Examination.* Washington, May 9-10. Deputy Director, Mr. Paul Foley, 1740 Massachusetts Avenue, N.W., Washington.

FLORIDA:* *Examination.* Jacksonville, June 26-28. Sec., Dr. Homer L. Pearson, 901 N.W. 17th St., Miami.

GEORGIA: *Examination.* Atlanta and Augusta, June 7-8. *Reciprocity.* June 9. Sec., Mr. R. C. Coleman, 111 State Capitol, Atlanta.

INDIANA: *Examination.* Indianapolis, June 21-23. Exec. Sec., Miss Ruth V. Kirk, 538 K. of P. Building, Indianapolis.

IOWA:* *Examination.* Iowa City, June 13-15. Exec. Sec., Mr. Ronald V. Saf, State Office Bldg., Des Moines.

KANSAS: *Examination and Endorsement.* Kansas City, June 8-9. Sec., Dr. O. M. Davidson, 872 New Brotherhood Bldg., Kansas City.

KENTUCKY: *Examination.* Louisville, June 6-8. Asst. Sec., Mr. Raymond F. Dixon, 620 S. 3rd St., Louisville.

LOUISIANA: *Regular. Examination and Reciprocity.* New Orleans, June 2-4. Sec., Dr. Edwin H. Lawson, 930 Hibernia Bank Bldg., New Orleans. *Homeopathic. Examination and Reciprocity.* Subject to Call. Sec., Dr. F. H. Hardenstein, 903 Pere Marquette Bldg., New Orleans 12.

MARYLAND: *Regular Examination.* Baltimore, June 21-24. Sec., Dr. Lewis P. Gundry, 1215 Cathedral St., Baltimore 18. *Homeopathic Examination. Written.* Baltimore, June 20-22. Sec., Dr. Robert H. Reddick, Eastern Shore State Hospital, Cambridge.

MASSACHUSETTS: *Examination.* Boston, July 12-15. Sec., Dr. Robert C. Cochrane, Room 37, State House, Boston.

MICHIGAN:* *Examination.* Ann Arbor and Detroit, June 15-17 (tentative). Sec., Dr. J. Earl McIntyre, 118 Stevens T. Mason Bldg., Lansing 8.

MINNESOTA:* *Examination.* Minneapolis, April 19-21 and June 14-16. Sec., Dr. F. H. Magney, 230 Lowry Medical Arts Bldg., St. Paul 2.

MISSISSIPPI: *Examination and Reciprocity.* Jackson, June 27-29. Asst. Sec., Dr. R. N. Whitfield, State Board of Health, Jackson.

NEBRASKA:* *Examination.* Omaha, June. Director, Bureau of Examining Boards, Mr. Husted K. Watson, State Capitol Bldg., Room 1009, Lincoln 9.

NORTH CAROLINA: *Examination.* Raleigh, June 20-23. *Reciprocity.* Pinehurst, May 2, Blowing Rock, July 29. Sec., Dr. Joseph J. Combs, 716 Professional Building, Raleigh.

NORTH DAKOTA: *Examination.* Grand Forks, July 6-8. *Reciprocity.* Grand Forks, July 9. Sec., Dr. C. J. Glaspel, Grafton.

OHIO: *Reciprocity.* Columbus, April 5. *Written.* Columbus, June 13-15. Sec., Dr. H. M. Platter, 21 W. Broad St., Columbus 15.

OKLAHOMA:* *Examination.* Oklahoma City, June 7-8. Sec., Dr. C. Gallagher, 813 Braniff Bldg., Oklahoma City.

PENNSYLVANIA: *Examination.* Philadelphia and Pittsburgh, June 27-29. Acting Sec., Mrs. Marguerite G. Steiner, Box 911, Harrisburg.

SOUTH CAROLINA: *Examination.* Columbia, June 27-29. *Reciprocity.* Charleston, May 10. Sec., Mr. N. B. Heyward, 1329 Blanding St., Columbia.

SOUTH DAKOTA:* *Examination and Reciprocity.* Rapid City, July 19-20. Exec. Sec., Mr. John C. Foster, 300 First National Bank Bldg., Sioux Falls.

TEXAS:* *Examination and Reciprocity.* Fort Worth, June 20-22. Sec., Dr. M. H. Crabb, 1714 Medical Arts Bldg., Fort Worth 2.

VIRGINIA: *Examination.* Richmond, June 16-18. *Reciprocity.* Richmond, June 15. Address: The Secretary, 631 First St., S.W., Roanoke.

WASHINGTON:* *Examination and Reciprocity.* Seattle, July 10-13. Sec., Mr. Edward C. Dohm, Capitol Bldg., Olympia.

WYOMING: *Examination and Reciprocity.* Cheyenne, June 6. Sec., Dr. Franklin D. Yoder, State Office Bldg., Cheyenne.

ALASKA:* On application. Sec., Dr. W. M. Whitehead, 172 South Franklin St., Juneau.

GUAM: The Commission on Licensure will meet whenever a candidate appears or submits his credentials. Sec., Dr. John E. Kennedy, Agana.

HAWAII: *Examination.* Honolulu, July 11-14. Sec., Dr. I. L. Tilden, 1020 Kapiolani St., Honolulu.

VIRGIN ISLANDS: *Examination and Reciprocity.* St. Thomas, June 8-9. Sec., Dr. Earle M. Rice, St. Thomas.

BOARDS OF EXAMINERS IN THE BASIC SCIENCES

ARKANSAS: *Examination.* Little Rock, May 3-4. Sec., Mr. S. C. Dellinger, Zoology Dept., University of Arkansas, Fayetteville.

DISTRICT OF COLUMBIA: *Examination.* Washington, April 18-19. Deputy Director, Mr. Paul Foley, 1740 Massachusetts Ave., N.W., Washington.

FLORIDA: *Examination.* Miami and Gainesville, May 14. Sec., Mr. M. W. Emmel, Box 340, University of Florida, Gainesville.

NEBRASKA: *Examination.* Omaha, May 3-4. Director, Mr. Husted K. Watson, 1009 State Capitol, Lincoln.

OREGON: *Examination.* Portland, June 4, Sept. 10, and Dec. 3. Sec., Mr. Charles D. Byrne, State Board of Higher Education, Eugene.

SOUTH DAKOTA: *Examination.* Vermillion, June 10-11. Sec., Dr. Gregg M. Evans, 310 E. 15th St., Yankton.

WASHINGTON: *Examination.* Seattle, July 6-7. Sec., Mr. Edward C. Dohm, Capitol Bldg., Olympia.

WISCONSIN: *Examination.* Milwaukee, May 14, Madison, Sept. 23. Sec., Mr. William H. Barger, 621 Ransom St., Ripon.

ALASKA: On application. Juneau or other towns in Territory as decided by Board. *Reciprocity.* On application. Sec., Dr. C. Earl Albrecht, Box 1931, Juneau.

*Basic Science Certificate required.

MAGAZINE–TELEVISION REPORT

The following list of current medical articles in mass-circulation magazines and forthcoming network television programs on medical subjects is published each week only for the information of readers of THE JOURNAL. *Unless specifically stated, the American Medical Association neither approves nor disapproves of the articles and programs reported.*

TELEVISION

Sunday, April 17

CBS-TV, 4:30 p. m. EST. "Search" presents the second of two reports on mental illness from Tulane University School of Medicine.

Monday, April 18

NBC-TV, 9 p. m. EST. "Medic" gets across a double message—home safety and the accomplishments of plastic surgery. The story is about two children seriously burned in a household accident.

MAGAZINES

Saturday Evening Post, April 9, 1955

"The Medicine That Melts Anxiety," by Steven M. Spencer

"A versatile new drug, chlorpromazine, is bringing almost magic relief to thousands of men and women plagued by tensions and anxieties." Mr. Spencer describes the effects of the French discovery on patients with mental disturbances, hiccups, and other conditions that require relaxation for treatment.

Collier's, April 15, 1955

"The Problem of Our Mental Hospitals," by Albert Deutsch

The author points out the variance in state laws on the admitting of patients to mental hospitals. He recommends that all states follow the example set by Utah and Nebraska and adopt the model state law governing commitment and release framed by the National Institute of Mental Health and the National Association for Mental Health.

Parade, April 17, 1955

"Cancers That Glow in the Dark," by Robert P. Goldman

In a new preoperative technique, porphyrine is injected into patients with cancer undergoing surgery. In the operating room under ultra-violet light, cancer tissues glow bright red. Among dangers of the method: patient becomes "photosensitive" and cannot be exposed to light for a week to 10 days.

The American Weekly, April 17, 1955

"10 Myths About Your Health," by William Engel

Thomas Kirk Cureton, Ph.D., of the University of Illinois Physical Fitness Research Laboratory gives advice on physical fitness and explodes some "theories."

DEATHS

Goddard, Calvin Hooker, Colonel, U. S. Army, retired, Washington, D. C.; born in Baltimore Oct. 30, 1891; Johns Hopkins University School of Medicine, Baltimore, 1915; honor graduate, Army Medical School, Washington, D. C., 1917; commissioned a lieutenant in the medical corps of the U. S. Army Feb. 18, 1917; promoted through the grades to major March 28, 1918; served in the United States, France, Germany, and Poland; resigned from the Army June 2, 1920; assistant director of Johns Hopkins Hospital in Baltimore from 1921 to 1924, when he became administrative director of the Cornell Clinic in New York; from 1925 to 1929 developed the identification of fired bullets and empty cartridge cases, now known as forensic ballistics; managing director of the Scientific Crime Detection Laboratory, Northwestern University, from 1929 to 1933, director of research from 1933 to 1934, and professor of police science at the law faculty from 1930 to 1934; member of the board of editors and advisors of *Encyclopedia Britannica* since 1940; recalled to active service as lieutenant colonel in the U. S. Army, and assigned to historical section, Army War College, from 1941 to 1942; chief, historical section, Ordnance Department, from 1942 to 1945; member of the historical division, War Department Special Staff, from 1945 to 1947; member of the historical section G/2 general headquarters, Far East Command, Tokyo, Japan, to 1948; chief of criminal investigation laboratory, Far East Command, Tokyo, from 1948 to 1951 when he became chief of the historical unit of the Army Medical Service; promoted to colonel in 1950; retired in June, 1954; awarded the Legion of Merit and the Order of the Crown of Italy; died Feb. 22, aged 63, of pulmonary embolism.

Boas, Ernst Philip ⊕ New York City; born in Worcester, Mass., Feb. 4, 1891; Columbia University College of Physicians and Surgeons, New York, 1914; from 1938 to 1951 assistant clinical professor of medicine at his alma mater; specialist certified by the American Board of Internal Medicine; member of the American Society of Clinical Investigation, New York Academy of Medicine, Harvey Society, the New York and American Heart associations, Phi Beta Kappa, and Alpha Omega Alpha; served as chairman of the Welfare Council's Committee on Chronic Illness, as a member of the heart committee of the New York Tuberculosis and Health Association, and as chairman of the medical advisory council of the Sidney Hillman Health Center; founder of the National Committee for Resettlement of Foreign Physicians, Inc., and member of the board of directors; a captain in the Army Medical Reserve Corps from 1917 to 1919; author of "The Unseen Plague—Chronic Disease," "Treatment of the Patient Past Fifty," "Add Life to Your Years," and "Cardiac Injury Resulting from Effort or Trauma"; associate editor of *Modern Hospital* from 1923 to 1929; served on the staffs of the Montefiore Hospital, where he was medical director for many years, and the Mount Sinai Hospital, where he died March 9, aged 64, of carcinoma of the pancreas.

Curley, John Joseph ⊕ Leominster, Mass.; born in Marlboro, Mass., July 23, 1899; Tufts College Medical School, Boston, 1922; member of the House of Delegates of the American Medical Association from 1948 through 1952; past president of the Worcester North District Medical Society, of which he was councillor; past vice-president of the Massachusetts Medical Society and served on the nominating council and the executive council; member of the New England Obstetrical and Gynecological Society and the Massachusetts Medico-Legal Society; fellow of the American College of Surgeons and the International College of Surgeons; a member of the U. S. Committee of the World Medical Association; for many years associate medical examiner of the third Worcester district and since 1952 medical examiner; a trustee of the Boston Medical Library; served during World Wars I and II; chairman of the board of health of Leominster; president of the Leominster chapter of the American Red Cross; on the courtesy staffs of the Clinton (Mass.) Hospital and the Burbank Hospital, Fitchburg; consultant at the Fitchburg (Mass.) General Hospital; for many years associated with the Leominster Hospital, where he was chief of the surgical staff, and where he died Feb. 18, aged 55, of ruptured aneurysm of the abdominal aorta.

French, George Reuben Williamson ⊕ Commander, U. S. Navy, retired, Berkeley, Calif.; born at Taunton, Mass., Jan. 24, 1883; University of Pennsylvania Department of Medicine, Philadelphia, 1908; appointed an acting assistant surgeon, U. S. Navy June 18, 1909, and promoted to commander in the medical corps of the U. S. Navy Jan. 1, 1925; retired in 1937; recalled to active duty in June, 1940; released from active duty in 1945; from 1914 to 1915 assisted in the preparation of a diving manual and in the investigation of deep sea-diving methods; at the Naval Torpedo Station, Newport, R. I., 1916 to 1917, assigned to duties in connection with the organization of a deep sea-diving school; later assisted with the salvage operations of the U.S.S. S-5; in 1922 assigned to Edgewood (Md.) Arsenal, in connection with the development of gas warfare for Naval use; during more than 33 years active service in the medical corps of the Navy, served in the U.S.S. Nero, Panther, Maryland, Maine, Michigan, Beaver, Fallon, California, Oklahoma, and Lexington; served at the Naval hospitals in Newport, R. I., Mare Island, Calif., Brooklyn, N. Y., and Chelsea, Mass.; also served two tours of duty at the Naval Medical School, Washington, D. C.; died in the Naval Hospital, Oakland, Feb. 26, aged 72, of arteriosclerosis.

O'Connell, Joseph Cyril ⊕ Providence, R. I.; born in Wakefield, Mass., Dec. 24, 1878; Harvard Medical School, Boston, 1901; chairman, Rhode Island Board of Examiners in Medicine; past president of the Rhode Island Medical Society; member of the founders group of the American Board of Surgery; member of the New England Surgical Society, American Urological Association, and the National Gastroenterological Association; fellow of the American College of Surgeons; in World War I served as a lieutenant in the naval reserve at Queenstown, Ireland, and in World War II as director of medical aid for the state civil defense organization; president of the Rhode Island Medical Society's Physicians Service for five years; secretary of the board of hospital commissioners of the city of Providence and a member of the state hospital advisory council; associated with the Providence Lying-In Hospital, Rhode Island Hospital, Butler Hospital, Miriam Hospital, Charles V. Chapin Hospital, Roger Williams General Hospital, and the Pawtucket (R. I.) Memorial Hospital; a director of the Narragansett Electric Company; died in the U. S. Naval Air Station Infirmary at Quonset Point March 3, aged 76, of cerebral hemorrhage.

Dickinson, Melville Day Jr., Tokyo, Japan; born in Troy, N. Y., Nov. 21, 1903; Harvard Medical School, Boston, 1928; certified by the National Board of Medical Examiners; resigned from the regular U. S. Navy April 6, 1934, when he began private practice in Geneva, N. Y., continuing until 1944; joined the U. S. Naval Reserve as a lieutenant commander, serving for a year as senior medical officer on the U. S. S. Albermarle, with the Atlantic fleet; then went with the United Nations Relief and Rehabilitation Administration in China, where he advised and supervised the distribution of medical supplies; for three years, from 1949 to 1951, served as chief of the communicable disease control branch of the public health and welfare section of the Supreme Command, Allied Powers in Japan; for his work in this field received two citations; died in the Seibo Hospital Dec. 20, 1954, aged 51, of coronary occlusion and pneumonia.

Alford, Thomas Franklin, Murfreesboro, Ark.; University of Arkansas School of Medicine, Little Rock, 1905; died Nov. 12, 1954, aged 80, of ruptured abdominal artery and heart block.

Arrington, Oscar N. ⊕ Brookhaven, Miss.; Medical Department of Tulane University of Louisiana, New Orleans, 1907; died in King's Daughters Hospital Jan. 14, aged 77, of cerebral hemorrhage, hypertension, and arteriosclerosis.

⊕ Indicates Member of the American Medical Association.

Bigelow, Samuel Irvin ⊕ Lansdowne, Pa.; Jefferson Medical College, Philadelphia, 1927; served during World War I; examining physician for the American Tobacco Company; associated with the Delaware County Hospital, Drexel Hill, and the Thomas M. Fitzgerald Mercy Hospital, Darby, where he died Feb. 27, aged 60, of pneumothorax and pelvic abscess.

Boyett, William L., Whiteville, Tenn.; Memphis (Tenn.) Hospital Medical College, 1902; died Feb. 4, aged 86, of carcinoma of the bladder.

Brook, Clarence Loe ⊕ Tuscaloosa, Ala.; Tulane University of Louisiana School of Medicine, New Orleans, 1938; served an internship and residency at Methodist Hospital in Dallas, Texas; died March 2, aged 44, of cardiac arrest due to left bundle branch block.

Brown, Rufus Stennis ⊕ Jackson, Tenn.; Mississippi Medical College, Meridian, 1908; Memphis (Tenn.) Hospital Medical College, 1912; served as chairman of the selective service board of Madison County in World War II and received a citation from President Roosevelt for meritorious service; associated with the Jackson-Madison County General Hospital; died Feb. 13, aged 78, of coronary occlusion.

Champ, Anthony Marius ⊕ Brockton, Mass.; Harvard Medical School, Boston, 1922; served during World War II; associated with the Brockton Hospital; died Feb. 12, aged 62, of injuries received in an automobile accident.

Charlton, Thomas Jackson, Savannah, Ga.; Yale University School of Medicine, New Haven, 1923; certified by the National Board of Medical Examiners; served during World Wars I and II; medical superintendent of the Georgia Infirmary; died Feb. 27, aged 59.

Clinton, Roland Smith ⊕ Gastonia, N. C.; University of Maryland School of Medicine, Baltimore, 1914; served during World War I; in March, 1951, was named Gaston County's "Doctor of the Year"; associated with the Garrison General, Gaston County Negro, and Gaston Memorial hospitals; died Jan. 21, aged 63, of subacute bacterial endocarditis, and arteriosclerosis.

Cohen, Maurice ⊕ Brooklyn, N. Y.; Long Island College Hospital, Brooklyn, 1931; died Dec. 19, 1954, aged 47, of coronary thrombosis.

Crowther, Henry Lewis ⊕ Philadelphia; Hahnemann Medical College and Hospital of Philadelphia, 1928; clinical professor of obstetrics at his alma mater; specialist certified by the American Board of Obstetrics and Gynecology; associated with the Elm Terrace Hospital in Lansdale, the Women's Homeopathic Hospital, and the Hahnemann Hospital; died Feb. 21, aged 52.

Dooman, David Stoddard, Los Gatos, Calif.; Columbia University College of Physicians and Surgeons, New York, 1918; served during World Wars I and II; adjutant of the Los Gatos Disabled American War Veterans; died in San Jose Jan. 27, aged 60.

Eden, Russell Joseph ⊕ Scranton, Pa.; Georgetown University School of Medicine, Washington, D. C., 1952; interned at Scranton (Pa.) State Hospital; certified by the National Board of Medical Examiners; associated with the Veterans Administration in Wilkes-Barre; died in the James Ewing Hospital, New York City, Nov. 2, 1954, aged 29, of pneumonia and leukemia.

Farrell, Edward Vincent ⊕ Whitehall, N. Y.; University of Vermont College of Medicine, Burlington, 1910; past president of the Washington County Medical Society; served with base hospitals in France during World War I; since 1952 health officer and school physician; surgeon for the Delaware and Hudson Railroad; died Feb. 20, aged 70, of hypertensive cardiovascular disease.

Fitzgerald, Charles Arnold ⊕ Clarion, Pa.; University of Pennsylvania School of Medicine, Philadelphia, 1915; an associate member of the American Medical Association; served with the American Expeditionary Forces in France during World War I; associated with the Oil City (Pa.) Hospital, where he died Feb. 19, aged 62, of gastrointestinal hemorrhage.

Gerber, Jacob Wolfe, Bridgeport, Conn.; University of Maryland School of Medicine, Baltimore, 1904; police surgeon; died Feb. 26, aged 74, of heart disease.

Gould, Harold Vogt ⊕ Chicago; University of Illinois College of Medicine, Chicago, 1912; specialist certified by the American Board of Internal Medicine; on the attending staff of the Ravenswood Hospital, where he died Feb. 22, aged 65, of arteriosclerosis.

Gray, Wesley Harold ⊕ Colville, Wash.; University of Western Ontario Faculty of Medicine, London, Ontario, Canada, 1923; served with the Canadian forces during World War I; died in the Mount Carmel Hospital Feb. 11, aged 60, of coronary occlusion.

Howell, William Irving, Lexington, Tenn.; University of Tennessee College of Medicine, Memphis, 1911; died Dec. 28, 1954, aged 80, of pneumonia.

James, Oliver Victor ⊕ Milford, Del.; University of Maryland School of Medicine, Baltimore, 1906; past president of the Kent County Medical Society; charter member and past president of the Rotary Club; for many years associated with the Milford Memorial Hospital, where he was past president of the medical staff, and where he died Feb. 22, aged 75, of ruptured dissecting aortic aneurysm with pneumothorax.

Johnson, Jacob Roberts ⊕ Herkimer, N. Y.; University of the City of New York Medical Department, New York City, 1887; an associate member of the American Medical Association; died in the Marcy (N. Y.) State Hospital March 3, aged 93, of arteriosclerosis.

Kebler, Lyman Frederick ⊕ Washington, D. C.; George Washington University School of Medicine, Washington, 1906; formerly on the faculty of Georgetown University School of Medicine; in 1929 retired as chief of drug laboratory, Bureau of Chemistry, U. S. Department of Agriculture; died March 4, aged 91.

Kipnis, Harry ⊕ Oak Park, Ill.; Northwestern University Medical School, Chicago, 1930; assistant chief, diagnostic center, Veterans Administration Hospital, Hines; died Feb. 14, aged 49, of hypertensive cardiovascular disease.

Langdon, William Carson ⊕ Cincinnati; Miami Medical College, Cincinnati, 1895; served during World War I; died in the Good Samaritan Hospital Feb. 9, aged 80, of arteriosclerotic heart disease.

La Rochelle, Fred Desire ⊕ Springfield, Mass.; Jefferson Medical College of Philadelphia, 1911; founder and past president of the Springfield Infirmary, where he died Jan. 30, aged 66, of cerebral hemorrhage and hypertensive cardiovascular disease.

Lashley, Donald Leartus ⊕ Tell City, Ind.; Indiana University School of Medicine, Indianapolis, 1937; served during World War II; member of the Tell City school board; formerly secretary of Perry County Medical Society and the First District Medical Society; served as president of the staff of the Perry County Memorial Hospital; died in the Deaconess Hospital, Evansville, Dec. 22, 1954, aged 43, of acute coronary thrombosis.

LeBlanc, Florimond Joseph ⊕ Elgin, Ill.; Bennett Medical College, Chicago, 1912; on the staff of St. Joseph Hospital and Sherman Hospital; died in Oak Park Hospital in Oak Park March 7, aged 70, of carcinoma of the gallbladder.

Lee, Frank Charles, Cleveland; Cleveland Medical College, Homeopathic, 1891; died Jan. 31, aged 87, of subarachnoid hemorrhage and arteriosclerosis.

Lester, Rollin Harold ⊕ Morrison, Ill.; University of Illinois College of Medicine, Chicago, 1927; past president of the Whiteside County Medical Society; died in St. Mary's Hospital, Rochester, Minn., March 1, aged 53, of bronchopneumonia and glioma of the brain.

Lindley, William R., Terrell, Texas; Baltimore Medical College, 1898; died Jan. 27, aged 78, of acute coronary thrombosis.

Loadholdt, G. W. I. ⊕ Fairfax, S. C.; Medical College of the State of South Carolina, Charleston, 1898; for many years chairman of the board of trustees of the local school board; died Feb. 12, aged 83, of cancer of the liver.

McCleary, Joseph Roy, Cincinnati; Pulte Medical College, Homeopathic, 1900; on the staff of the Bethesda Hospital, where he died Jan. 14, aged 79, of carcinoma of the cecum.

McCormick, Robert E. Lee ⊕ Irwin, Pa.; Western Pennsylvania Medical College, Pittsburgh, 1903; past president of the Westmoreland County Medical Society; formerly county medical director; on the staff of the Westmoreland Hospital in Greensburg; on the board of the Torrance (Pa.) State Hospital; died Dec. 27, 1954, aged 79, of arteriosclerosis.

McCullough, Gilbert Francis, Davenport, Iowa; Northwestern University Medical School, Chicago, 1908; died Feb. 11, aged 72, of auricular fibrillation and coronary thrombosis.

McLeish, George Martin ⊕ Louisville, Ky.; University of Louisville Medical Department, 1912; an associate member of the American Medical Association; served in France during World War I; associated with the Jewish Hospital, Norton Infirmary, and St. Joseph Infirmary; died Feb. 18, aged 69, of cerebral arteriosclerosis with terminal pneumonia.

Marks, Philip Edward ⊕ Pittsburgh; University of Pennsylvania School of Medicine, Philadelphia, 1912; for many years superintendent, bureau of infectious diseases, department of public health; served on the staff of the Western Pennsylvania Hospital; died in the Columbia (Pa.) Hospital Feb. 18, aged 73, of acute coronary occlusion.

Meanor, Harold Henderson ⊕ Coraopolis, Pa.; Medical Department of the Western University of Pennsylvania, Pittsburgh, 1906; member of the Radiological Society of North America; fellow of the American College of Surgeons; director of the Coraopolis Trust Company; on the senior surgical staff of Sewickley (Pa.) Valley Hospital, where he died Feb. 19, aged 71, of myocardial infarction.

Michener, William Ernest ⊕ Topeka, Kan.; University of Kansas School of Medicine, Kansas City, 1910; served during World War I; on the staffs of St. Francis Hospital and Stormont-Vail Hospitals; died Feb. 24, aged 73, of myocardial infarction.

Monzingo, Forrest Leon ⊕ Muskogee, Okla.; Northwestern University Medical School, Chicago, 1938; chief of professional services at the Veterans Administration Hospital; served during World War II; died Jan. 25, aged 52, of adenocarcinoma of the cerebellum.

Moyers, Oden Hunter, Harriman, Tenn.; University of Tennessee College of Medicine, Memphis, 1913; died Dec. 20, 1954, aged 67.

Newton, Roland Stephen ⊕ Westboro, Mass.; Medico-Chirurgical College of Philadelphia, 1905; for many years medical examiner for the Fifth Worcester District; a director of the First National Bank; a trustee of the Westboro Savings Bank; died Feb. 4, aged 74, of coronary sclerosis.

O'Hara, Francis Paul ⊕ San Diego, Calif.; Stanford University School of Medicine, San Francisco, 1928; fellow of the American College of Surgeons; member of the American College of Chest Physicians and the American Trudeau Society; served during World War II; on the staffs of the San Diego County Hospital and the Mercy Hospital, where he died Feb. 12, aged 52, of lymphatic leukemia.

O'Meara, James John ⊕ Jackson, Mich.; Northwestern University Medical School, Chicago, 1911; died in the Mercy Hospital March 7, aged 68.

Piercy, Frederick Franklin ⊕ Youngstown, Ohio; Drake University College of Medicine, Des Moines, 1907; specialist certified by the American Board of Otolaryngology; member of the American Academy of Ophthalmology and Otolaryngology; fellow of the American College of Surgeons; on the staff of the Youngstown Hospital; died Feb. 17, aged 73, of cerebral hemorrhage.

Robelen, Charles Henry Cleads ⊕ Philadelphia; Hahnemann Medical College and Hospital of Philadelphia, 1905; died Feb. 26, aged 76.

Scott, John Herbert Bryce, Columbus, Ohio; Ohio State University College of Medicine, Columbus, 1926; died Jan. 30, aged 79, of congestive heart failure.

Shields, Ida Russell, New York City; University of London Faculty of Medicine, London, England, 1905; Long Island College Hospital, Brooklyn, 1920; died Jan. 25, aged 78, of a heart attack.

Shuman, John William Jr. ⊕ Playa Del Rey, Calif.; Washington University School of Medicine, St. Louis, 1938; specialist certified by the American Board of Anesthesiology; member of the American Society of Anesthesiologists; served during World War II; formerly associated with the Methodist Hospital of Southern California in Los Angeles, where he died Jan. 16, aged 41, of Hodgkin's disease.

Singletary, Winston Burnelle ⊕ Baton Rouge, La.; Vanderbilt University School of Medicine, Nashville, Tenn., 1904; an associate member of the American Medical Association; died Jan. 12, aged 74, of lung cancer.

Smith, William Benjamin, Joplin, Mo.; Kentucky School of Medicine, Louisville, 1902; past president of the Ottawa County (Okla.) Medical Society; served during World War I; formerly on the staff of the Miami Baptist Hospital in Miami, Okla.; died Feb. 9, aged 85, of cerebral hemorrhage.

Smith, William Hereford, Danville, Ky.; Cornell University Medical College, New York, 1900; member of the Kentucky State Medical Association; past president of the Boyle County Medical Society; served as president of the Boyle County Board of Health; on the staff of the Ephraim McDowell Hospital; died Feb. 15, aged 78, of arteriosclerotic heart disease.

Stoll, Arthur Hugh ⊕ Oxnard, Calif.; Northwestern University Medical School, Chicago, 1906; an associate member of the American Medical Association; past president of the Ventura County Medical Society; on the staff of Foster Memorial Hospital in Ventura and St. John's Hospital; died Jan. 26, aged 71, of coronary occlusion.

Stribley, Harry Alexander ⊕ Dubuque, Iowa; State University of Iowa College of Medicine, Iowa City, 1918; member of the American Academy of General Practice; served during World War I; on the staff of St. Joseph's Sanitarium, Finley Hospital, Mercy Hospital, and Xavier Hospital; died Feb. 7, aged 61, of acute coronary thrombosis, arteriosclerosis, and thyrotoxicosis.

Stucke, Edmund C., Garrison, N. D.; Jefferson Medical College of Philadelphia, 1910; state senator; formerly county coroner; died in Bismarck (N. D.) Hospital Jan. 12, aged 72, of coronary thrombosis.

Sutter, John Jay, Lakeside, Ohio; Eclectic Medical Institute, Cincinnati, 1898; member of the American Public Health Association; formerly health officer of Bluffton, and health commissioner of Allen County; served as health commissioner for Wayne County and also for the city of Wooster; died in St. Rita's Hospital in Lima, Feb. 11, aged 81, of cerebral hemorrhage.

Tir, Morris I., Chicago; Chicago College of Medicine and Surgery, 1912; clinician at the Cook County Jail for many years; died Feb. 25, aged 72, of coronary thrombosis.

DIED WHILE IN MILITARY SERVICE

Evans, David Sproul ⊕ Lieutenant Colonel (MC) U. S. Air Force, Danville, Calif.; born in Glasgow, Scotland, Aug. 4, 1901; University of Western Ontario Faculty of Medicine, London, Ontario, Canada, 1931; specialist certified by the American Board of Psychiatry and Neurology; member of the American Psychiatric Association; interned at the Delaware Hospital, Wilmington, Del.; formerly a resident in psychiatry at the Willard (N. Y.) State Hospital and the Pilgrim State Hospital, Brentwood; served during World War II; chief of neuropsychiatric service at the U. S. Air Force Hospital, Parks Air Force Base, Calif., where he died Jan. 22, aged 53, of aplastic anemia and cerebral hemorrhage.

FOREIGN LETTERS

ENGLAND

The Health of the Schoolchild.—In his report as Chief Medical Officer of the Ministry of Education for 1952 and 1953, Sir John Charles urges the retention of handicapped children in ordinary schools wherever possible. Most of these children will have to enter unsheltered industry on leaving school, and the more accustomed they are to living in a normal environment the more likely they are to become self-reliant men and women. This is not a criticism of the special schools that are essential for severely handicapped children. In 1953, there were 2,068,376 periodic medical inspections and 2,388,900 special inspections and reinspections, and these revealed that 2.26% of the children were in poor general condition. Although the number of verminous children has been slowly decreasing, there were still 316,854 of them in 1953. Despite the reduction in the incidence, and also the degree, of infestation reported by school physicians, complaints are still made that many children, especially girls, entering industry are verminous. This is, essentially, a family problem. Lice in children will never be eradicated until their families become clean. There has been a reduction in the number of children with ringworm of the scalp and body and scabies, but an increase in impetigo to 34,365. The generally accepted treatment of scalp ringworm is epilation by x-rays followed by applications of a fungicidal ointment. With such treatment most children may return to school about four weeks after epilation. An analysis of the 102 survivors of the 370 patients with proved tuberculous meningitis treated by streptomycin (not dihydrostreptomycin) showed that only four were deaf. In a smaller series of 26 similar patients with 14 survivors, 8 of these survivors had received dihydrostreptomycin, and of these 7 showed impairment of hearing, with 4 being totally deaf. The number of children with defective vision, excluding squint, was 102,696. The incidence of squint was 10.2 per 1,000 periodic inspections. No figures were given for color blindness, but figures quoted from different areas indicated an incidence of about 5% for boys and 0.3% for girls. Although many educational authorities have well-developed orthoptic schemes, it cannot be claimed that orthoptic treatment is a cure for all patients with squint, and in many patients recourse to other methods is necessary, but orthoptic treatment is a valuable one, and its use produces a higher rate of cure.

A special chapter is devoted to asthma in childhood. In recent years the proportion of asthmatic children in open-air schools has increased, and in some of these schools nearly half the children suffer from asthma. It is not known whether there has been a real increase in the number of these patients or whether since children suffering from malnutrition and debility have become fewer, places have been more readily available for patients with asthma. Views regarding the value of residential schools differ widely. Among the advantages are attention to physical welfare, smaller classes and relief from family and home tensions. Also a child can attend school more regularly than if he remained at home, but it is not enough to label a child "asthmatic" and send him away for an indefinite period. Selection should be preceded by careful investigation. Once selected, efforts should be made to preserve the child's link with the home. In some schools the exercises recommended by the Asthma Research Council are carried out with varying degrees of success. Some of the benefit undoubtedly comes by building up confidence and knowing what to do when an attack is imminent. As there is no evidence that inhalers can do any harm, and they have made life tolerable for many children, it is probably unwise to prohibit their use. The Ministry of Education has approved proposals by local education authorities to send a limited number of asthmatic children abroad for treatment, but medical opinion is divided about the value of this procedure.

School canteens now head the list of premises from which outbreaks of food poisoning have been reported. In 1953, there were 32 food-poisoning outbreaks in schools: 3 were due to salmonella infection; 6 to Micrococcus; 5 to Clostridium welchii, and one to some other organisms. In the remaining outbreaks the causative organism was not identified. To maintain a sense of proportion, it is necessary to realize that 500 million school dinners are provided annually. Opinion differs as to the value of periodic medical examinations of canteen workers, but one school physician reported that out of one batch of 131 such workers, 39 had coagulase-positive Micrococcus in their nose and throat.

There has been a spectacular reduction in the number of deaths of schoolchildren from tuberculosis. In 1938 there were 937 deaths in the age group, 5 to 14 years, and in 1953 only 107. In the period from 1931 to 1935, respiratory tuberculosis accounted for the deaths of 2,494 children in this age group, compared with only 25 in 1953. As an example of the value of tuberculin testing of school entrants, 3,798 schoolchildren of Bournemouth were tested, and 177 gave a positive, and 28 a doubtful, reaction. Subsequent examination of the contacts of the positive and doubtful reactors revealed that 19 had adult-like disease; i. e., one new case of tuberculosis was found among the contacts for every 250 tuberculin tests applied to school entrants. Between 1943 and 1952, 1,038,014 pupils leaving school were examined at mass radiography units; it was found that 491 had active pulmonary tuberculosis; 598 had active postprimary disease (unilateral); 292 had active postprimary disease (bilateral); 111 had tuberculous pleural effusions; 29 had intrathoracic benign neoplasms, and one had an intrathoracic malignant new growth. It is now compulsory for all new teachers to have a roentgenogram taken of the lungs as part of the medical examination. Already established teachers reported to the Ministry of Education as having pulmonary tuberculosis numbered 246 in 1953.

It was expected by many that the introduction of the National Health Service would make unnecessary much of the work previously done by the school health service. So far this has not been so. The free provision of a general practitioner service for every child has had little effect on the school health service. The reduction in the number of children attending minor ailment clinics was ascribed by some school physicians to parents taking their children to general practitioners instead of, as formerly, to school clinics, but other school physicians believed that the reduction was due to diminished incidence of minor ailments and to efforts made to discourage the attendance of children with minor illnesses. The general opinion of school physicians was that there was better cooperation between them and general practitioners than ever before.

The Medical Iron Curtain.—We are fortunate in this country in the relationships that exist between the press and the profession, where the reporting of medical matters is concerned. Siamese twins, however, seem to have a knack of disturbing this state of affairs. When the Siamese twins from Nigeria were separated at Hammersmith Hospital in 1953, the medical authorities failed to appreciate the public interest in such an operation and therefore failed to provide the press with authoritative accounts of what was happening. The reactions of certain reporters was perhaps natural, but scarcely seemly, and the result was an indignant letter of protest from Prof. Ian Aird, the surgeon who performed the operation, which was published in the *British Medical Journal*. Memories of this episode may have been responsible for the circumstances surrounding the Keighley Siamese twins. The event has been given full publicity in all the newspapers, but the sequence of messages in *The Times* may be taken as typical. On Wednesday, Feb. 23, *The Times* carried the following paragraph on its front page: "Siamese twins whose birth last November has been kept secret by the authorities at Keighley, Yorkshire, are to be brought to London where . . . surgeons will try to separate them. The twins, two girls, who

The items in these letters are contributed by regular correspondents in the various foreign countries.

are joined at the crown of their heads, were born to a Keighley mother whose name is believed to be Gray. They have been named Margaret and Joan." The following day it carried on the same page the following item: "Arrangements to separate Yorkshire-born Siamese twins by an operation at Brook Hospital, Woolwich [in southeast London], were cancelled yesterday. . . . Mr. Geoffrey Knight, a brain surgeon, said that arrangements for him to see the children had been cancelled. He did not know where the twins were, he added. The twins . . . were born on Jan. 30, in Keighley Victoria Hospital and have been kept in an oxygen tent. Secrecy has been observed at the Keighley hospital, but it is understood that the twins . . . are perfectly healthy." On Saturday, Feb. 27, the following paragraph appeared: "The Siamese twins born . . . at Keighley, Yorkshire, have both died after an operation at University College Hospital, London. . . . The administrator and secretary of [the] hospital made the following statement last night: 'The conjoined twins were seen by Professor Ian Aird and Mr. Geoffrey Knight, who made arrangements to operate on them in the neurosurgical unit at Brook Hospital, Woolwich. The publicity that followed and the behavior of the press caused great distress and for this reason only it was considered inadvisable to proceed. In these circumstances Mr. Julian Taylor saw the twins in consultation with Prof. Ian Aird. Subsequently an operation was performed by Mr. Julian Taylor and Mr. David Matthews. For this the children were removed secretly to the private patients' wing at University College Hospital. Both children died.'" It is not surprising that on Feb. 26, when Fleet Street was busy trying to track down the twins, a reporter was heard to comment: "The medical iron curtain has certainly come down this time."

Tuberculosis in Scotland.—During the postwar years respiratory tuberculosis has been a major problem in Scotland. The last year has seen a marked improvement in the situation, as is well brought out by I. M. Macgregor in *Health Bulletin of the Department of Health for Scotland* for 1955. In 1931 the crude death rate per 100,000 was 62, falling to 51.7 in 1938. As in most European countries, however, it rose again during the war, the highest wartime level being 64.7 (in 1941). Unlike most other countries, the rate rose after the war, and in 1947 it had reached 66. Improvement then set in, and in 1952 the rate was down to 27.6, compared with 21.2 in England and Wales, 9.5 in The Netherlands, and 14.7 in the United States. Facilities for mass miniature radiography were developed, and 10 such units now operate in the country. An analysis of the first 730,000 examinations showed that the average tuberculosis rate per 1,000 examinations was 3.2 for children, 14.7 for contacts, and 16.1 for patients in mental hospitals. These figures were compared with the rate per thousand reported to health departments. For all ages, the reported rate for males was 1.7, compared with 5.0 for the mass radiography active case rate, the corresponding figures for females being 1.4 and 5.9. Among females the peak incidence occurred in the age range of 15 to 24 years, in respect to both reporting rate (4.3) and mass radiography yield (7.8). Among males the highest reported rate (5.8) was found in the same age group, but the peak discovered by mass radiography yield was in men over 45 (6.0 in the 45 to 49 years age group, and 8.8 in those over 60). Hospital waiting lists for patients with respiratory tuberculosis dropped dramatically in 1954. In 1950, the waiting list was over 3,000, and fell to around 1,859 in January, 1954, but by September it had fallen to 841. This decrease has not been due to an improvement in the bed situation, nor has there been any corresponding fall in the reported rate. The reason is that more patients are now under active medical treatment in their homes. Recent advances in medical treatment, earlier case recognition, and improved housing have brought an increasing number of tuberculous patients within the range of effective cure without hospitalization.

Incidence of Food Poisoning.—In a review of food poisoning in England and Wales in 1953, published in the *Monthly Bulletin of the Ministry of Health and the Public Health Laboratory Service* (**14**:34, 1955), it is stated that in 1953, 5,277 cases were recorded. These comprised 914 outbreaks, 422 of which were confined to members of single families, and 4,363 sporadic cases, and represented an increase over 1952 of 32% in public outbreaks, 24% in family outbreaks, and 55% in sporadic cases. Most of the increase was in salmonellosis. Outbreaks due to these organisms (213) were 82% higher than in 1952. Micrococci were the presumed causal organisms in 58 public outbreaks, 31 family outbreaks, and 599 sporadic cases. Fifty-one deaths were reported: 46 due to Salmonella and 2 to Micrococcus pyogenes var. aureus. In three cases the cause was not found. The foods known or strongly suspected to have been the vehicles of infection were recorded in 310 of the 914 public and family outbreaks. Fish was responsible in 24, meat in 199, sweetmeats (including ice cream) in 27, eggs in 25 (duck eggs in 18 of these), milk in 12, vegetables in 8, fruit in 7, and cheese in one. In about 80% of the outbreaks associated with meat, processed, made-up, or heated meat was involved; cold meats and meat pies being most prominently concerned. The place where the contamination of the food occurred was recorded in 166 (34%) of the 492 public outbreaks: 58 in canteens (including 32 in school canteens), 42 in restaurants, hotels, etc., 30 in shops, 21 in institutions, and 15 at private parties. These figures show a decrease in the proportion of outbreaks associated with canteens from an average of 47% for 1950 to 1952 to 35%, and an increase in the proportion associated with shops, restaurants, and hotels from 24% to 43%. Sixty outbreaks were recorded in hospitals: 40 due to Salmonella, 3 to Clostridium welchii, 2 to Micrococcus, and 15 to undiscovered agents.

Coloring Matter in Food.—Recommendations for the amendment of current regulations governing the use of coloring matter in foods are contained in a report published by the Food Standards Committee of the Ministry of Food. The present position is that any color not specifically prohibited by regulations may be used in foods other than milk. The addition of any coloring matter to milk is prohibited, and the list of prohibited colors for all foods includes: (1) compounds of antimony, arsenic, cadmium, chromium, copper, lead, mercury, and zinc, (2) gamboge, and (3) picric acid, Victoria yellow, aurine, Manchester yellow, and aurantia. The committee recommends that these regulations be amended so as to permit the use in foods of only those colors that the available evidence indicates are unlikely to have harmful effects. A list is given of 13 colors of natural origin and 32 synthetic colors that could be safely used, either singly or in any combination. It is further recommended that specifications of purity should be prescribed and published for each of the specified colors. Where practicable, the purchaser should be informed by labeling or other means when a food contains added color. This prohibition should be extended to all natural products such as meat, game, poultry, fish, fruit, and vegetables sold in the raw or unprocessed state. Although the federal law of the United States probably imposes greater control of food colors than the law of any other country, adoption of the United States Food, Drugs and Cosmetics list was not deemed practicable as that list would be insufficient to meet the present needs of the food industry in this country. Nevertheless the committee "fully appreciates the disadvantages inherent in the existence of different national lists and would support steps to facilitate exchange of biological information with a view to securing the greatest possible measure of uniformity."

Unhygienic Airport Canteen.—Details have been published of what the local Rural Council describe as the "shocking conditions" revealed at the canteen at Bovingdon Airport by the local health officer. Bovingdon Airport, in Hertfordshire, is one of the alternative civilian airports to London Airport in the event of weather conditions at the latter being unsatisfactory for landing planes. According to the health officer, he found the premises infested with mice and weevils, and the person in charge admitted the presence of cockroaches. The storage cupboards are reported as unsatisfactory, and, at the time of inspection, food was found in them in a state of decomposition. The report concluded: "In view of the fact that most of the people using the canteen are travelers from all over the world who rapidly disperse, the conditions must cause the council considerable misgiving. Apart from the inadequate buildings used for the canteen, in my opinion the premises are not efficiently supervised." A search is now under way for the responsible authority. A spokesman of Field Air Services, which runs the airport, claims that the canteen and its equipment belong to the Ministry of Transport and Civil Aviation who are responsible for its shortcom-

ings. A Ministry spokesman has stated that the Hertfordshire Agricultural Committee's disinfestation officers make regular visits and had been asked to pay particular attention to the canteen, but the spokesman of the Agricultural Committee has said "it is definitely nothing to do with us."

Heroin Banned.—In spite of protests from many clinicians, the government has now decided to take steps to give effect to the resolution adopted by the Economic and Social Council of the United Nations, urging all governments to prohibit the manufacture, import and export of heroin except for small amounts required for scientific purposes. This is being achieved by not renewing the current licenses for the general manufacture of heroin, which expire on Dec. 31, 1955. After that date licenses will only be granted for the manufacture of the small quantities required for scientific purposes and for the manufacture of nalorphine. No further exports will be authorized except when the export is requested by a government for one of these two purposes. The import of heroin will not be permitted. Heroin is still used to an appreciable extent in this country for the relief of intractable nonproductive cough. It has recently been pointed out that, in spite of this, there are no known addicts in the United Kingdom, whereas in the United States, where it has been banned since 1925, addiction to the drug is still a problem. It was omitted from the 1953 edition of the British Pharmacopoeia but is included in the 1954 issue of the British Pharmaceutical Codex. It has been suggested that the use of heroin for "scientific purposes," which is to be permitted, will allow of its limited use as a cough depressant in selected cases.

Athletic Training.—The athlete of today is no better than the athlete of a century ago, according to Sir Adolphe Abrahams, honorary medical adviser to the International Athletic Board, in a recent lecture on athletic training, past and present. Today's athlete neither is physically stronger nor has greater fortitude or courage. Sir Adolphe has no use for drugs and medicine in athletic training. Although tonics and strengthening medicines are usually figments of the imagination, there is a persistent belief among athletes that there must be something that would create energy or postpone fatigue. Part of the trouble here is that the athlete, especially the highly strung athlete, is an impressionable and suggestible person. The speaker had seen remarkable results from inert mixtures that could not possibly have produced the results in less impressionable subjects. If there were drugs that could stimulate the body to exertion beyond its normal limits of fatigue, they should be strictly forbidden. A certain minimal quantity of vitamins is essential to health, but there is no evidence that an excessive intake of vitamins improves athletic performances. Although one group of investigators has claimed remarkable results from the administration of vitamin B and, to a lesser extent, other vitamins, other workers were unable to confirm these results.

No-Claim Bonus for Health.—The executive of the National Union of Small Shopkeepers is considering a scheme of "no claim" bonuses for persons who do not call or visit a physician during the year. Under the scheme a no-claim bonus of 15% would be paid in the first year, 20% in the second, and 25% in the third, on the basis of national insurance contributions paid. The suggestion is that such a scheme would help to reduce the congestion in general practitioners' waiting rooms.

FINLAND

Metastatic Cancers of the Ovary.—Prof. A. Turunen of Helsinki University found the incidence of metastases in the patients with carcinoma of the corporis uteri who were operated on to be low (1.47%). The same applies in even greater degree to cancer of the cervix (0.55%). Other metastatic cancers of the ovary were usually associated with cancer of the stomach and occurred mostly in women of childbearing age, whereas the highest incidence of gastric cancer falls in the postmenopausal period. The hormonal activity of the ovaries, chiefly estrogen secretion, may be assumed to bear a relationship to the origin and rapid development of these metastases. In patients in whom the primary tumor was successfully removed by radical operation and the ovarian metastases were also completely removed, the prognosis depended on the recurrence of the primary tumor. Usually there were no recurrences in the pelvic cavity. One of the patients thus operated on has remained permanently well. The average postoperative survival time for the other patients was 10.2 months, and the removal of the metastatic ovarian tumors thus had only a palliative effect.

Back Pain and Sciatica.—Prof. K. E. Kallio reported recent experiences with back pain and sciatica in *Duodecim* (No. 1-2, 1955). In the last four years 217 patients have been operated on at the Orthopedic Clinic of Helsinki University for herniation of the nucleus pulposus; in 41 cases of back pain a fusion operation was performed for various causes (in 22 of these for spondylolisthesis). The total number of patients with back pain and sciatica examined at the outpatient department during the same period was 4,076. The cause of these conditions is not yet completely clear, and the value of the roentgenogram should not be overestimated. Extraspinal factors, bone diseases, trauma, and even tuberculosis, often do not receive sufficient consideration in the diagnosis. Back pain and sciatica constitute not only a medical but also a social problem. The cornerstone of the treatment is education of the patient. As these conditions have a tendency to spontaneous cure, the treatment should be conservative. Harm may be done with routine use of corsets and injections. In patients with herniation of the nucleus pulposus operation is still indicated in carefully selected cases, but there is no general agreement regarding the fusion operation.

Primary Sarcomas of the Lung.—Primary lung sarcomas must be regarded as unusual tumors. In the series of the first Surgical Clinic of the University of Helsinki between 1949 and 1953, their ratio to bronchogenic carcinomas was 1:214 according to Nylander and Aukee (*Duodecim* No. 1-2, 1955). No definite age predisposition was observed, but sarcomas of the lung were more frequent in the younger age groups. The incidence of pulmonary sarcoma was higher in men than in women, but the difference was not so great as in the case of carcinoma of the lung. The symptoms of pulmonary sarcoma are cough, chest pain, dyspnea, loss of weight, fatigue, fever, and in some patients joint pain. Some asymptomatic cases diagnosed on routine examinations have also been reported. The clinical signs agree fairly well with those of pulmonary carcinoma. Primary resection and postoperative irradiation is recommended. The prognosis is believed to be more favorable than that of lung cancer, but the number of cases reported is still too small for definite conclusions.

Bilateral Subtotal Adrenalectomy.—Six patients with pituitary basophilism due to adrenal hyperplasia were treated with subtotal bilateral adrenalectomy performed in two stages at intervals of two to four months (C. A. Hernberg, in *Duodecim* No. 1-2, 1955). Nine-tenths of both adrenals were removed. In one patient complete adrenalectomy was performed on one side and partial adrenalectomy on the other, 75% of the gland being removed. There were only slight signs of recurrence 18 months after operation. In each patient most of symptoms associated with the syndrome disappeared. In three of the five female patients the menstrual cycle was reestablished; one became pregnant. None showed signs of adrenal insufficiency, but in one patient there was marked darkening of the skin, probably due to pituitary overactivity. One patient died of an infection four months after operation.

Changes in Skin Grafts.—Studies reported by Dr. Risto Kivilaakso on adult rabbits showed that when a whole-thickness skin graft is used the organism destroys or isolates in it the tissue that is ectodermal in origin, and transforms the tissue that has developed from the mesoderm into an organic part of itself (*Acta orthopaedica scandinavica* supp. 18, 1955).

MEXICO

Bone Tumors.—Dr. Leonardo Zamudio reviewed 79 cases of bone tumors seen at the Hospital Infantil between 1943 and 1953 (*Boletín Médico del Hospital Infantil* **11**:365-411 and 539-560, 1954). He found that 43 tumors were benign and 36 were malignant. Of the benign tumors osteochondromas were most common. There were 10 giant cell tumors, even though all patients were less than 20 years of age. One osteoid osteoma of the skull was seen. This is believed to be the first time such a tumor has been reported at this site. In contrast to the situation in the adult, primary malignant bone tumors were more frequent than metastatic tumors. The most common primary tumors were the osteogenic sarcomas, and they predominated in boys aged 12 to 14 years. One soft odontoma presented signs of malignant disease after several biopsies, a circumstance that has been reported by other authors. In the metastatic tumors also in contrast to the findings in adults, sarcomas were more frequent than carcinomas. This could be explained by the fact that sarcomas are more common in young persons.

NETHERLANDS

Tuberculosis.—Because of the malnutrition of the population immediately following the German occupation and the high rate of tuberculosis among prisoners of war returned from Germany, the death rate from tuberculosis in 1945 was 60 per 100,000 inhabitants. In those days not even the boldest optimist would have prophesied that in 10 years the rapid reduction in the incidence of tuberculosis would present a problem. In 1949 treatment in a sanatorium was judged to be required by 3,500 patients on the waiting list, and a program of construction was projected. In 1951 it was concluded that the decreasing incidence of this disease demanded reconsideration of the former conclusions. In 1953 the waiting list had only 464 names, and it was decided that there was no need to increase the number of sanatorium beds in the near future. A committee of three health officers was appointed to report on this rapidly changing situation, and their report is now available in *Tijdschrift voor sociale geneeskunde* (**32**:509, 1954). By Oct. 1, 1954, the waiting list was reduced to 304. In 1953 there were more unused sanatorium beds than names on the waiting list. The problem now is how to best use the vacant sanatorium beds. It is recommended that the patients be moved from the smaller sanatoriums and temporary sanatoriums to the larger better equipped institutions. This involves geographical and religious difficulties. It is suggested that the beds be used for patients with chronic sickness and patients needing rehabilitation.

One of the causes of the optimistic view of the committee is the dramatic decline of tuberculosis in childhood according to J. D. de Haas in *Tijdschrift voor sociale geneeskunde* (**33**:29, 1955). Deaths from tuberculosis in persons up to 19 years of age decreased from 314 in 1949 to 64 in 1953. Although the death rate from tuberculosis is very low among infants this success should not cause a slackening in the fight against this disease. On the contrary, according to de Haas, a well-directed plan is more urgently needed than ever.

NORWAY

Pulmonary Tuberculosis.—The observation recently made by Prof. Haakon Natvig that the patient who returns to work after operative treatment for his pulmonary tuberculosis fares better than his fellow who receives only conservative treatment, prompted Dr. Gerhardt Hertzberg of the tuberculosis department of the Oslo Public Health Service to check on his own material, consisting of 244 tuberculous patients who returned to work after having received various forms of treatment. With only two exceptions, these patients had suffered from a destructive form of pulmonary tuberculosis, and they had all been helped by the Public Health Service to find work. They were classified in three groups according as they received conservative treatment (66), pneumothorax (90), or such operative treatment as thoracoplasty (88). The relapse rate was 33.3% in the first group, 26.7% in the second, and 15.9% in the third. Commenting on these findings at a meeting of tuberculosis specialists in Oslo in November, 1954, Hertzberg was careful to avoid drawing final conclusions, but he suggested that they might call for a revision of the conflicting claims for different methods of treatment. Might we not, he said, be readier than we have been in the past to advise tuberculous patients of the wage-earning age to accept the discomforts and disabilities of operative treatment because it is more likely in the long run to yield better results and to give more effective prevention of relapse? The high relapse rate (24.6%) in his series reflects the comparative severity of the original disease in this material, but it should not deter tuberculosis specialists from recommending a return to work as early as possible. After all, 75% of these ex-patients emerged safely from the first difficult year of return to work. The speaker deplored the policy of playing for safety and closing the door to a workshop for all except those whose tuberculosis is definitely inactive. One should rather take a risk before the patient has become too depressed, too untrained, and too work-shy, but it would be possible to reduce the present relapse rate and absenteeism from work with increased experience.

Treatment of Acute Poisoning.—The radical changes since 1949 in the conventional treatment of poisoning are reflected by Georg Omland in a study of 1,205 patients with acute poisoning admitted to the Ullevaal Hospital between 1950 and 1953 (*Nordisk medicin* for Jan. 27). These admissions represented 5% of all the admissions to the medical department of this hospital during this period. Such cases were less numerous before 1950, and there has been a further rise in their frequency in 1954 and 1955. The ratio of male to female patients with acute alcoholic poisoning was 18:1. Nearly 700 of the 1,205 patients represented attempts at suicide. The barbiturates outnumbered the other poisons with 603 cases. Alcohol came next with 227 cases, of which 142 were due to ethyl alcohol. Carbon monoxide was responsible for 42, and amphetamine for 23 cases; 70 of the 1,205 patients died (22 were already dead on arrival or died within an hour of admission). Several of the other deaths were due to causes other than the acute poisoning. Since 1949 treatment with stimulants has fallen into disrepute. The stomach pump is also used less than it was, partly because of the investigations of K. Möller, who has shown that little poison is left in the stomach four hours after it has been taken. Hence the practice, recommended by Omland, of not emptying the gastrointestinal tract if the poison was taken more than five or six hours earlier. Antibiotics are now given to most patients in coma to prevent pneumonia, and when respiration is superficial and the patient is cyanotic, oxygen is given. To prevent congestion, pneumonia, and bed sores the patient is shifted from one side to the other or to the back hourly, and much attention is paid to fluid balance. The respiratory passages are kept open, aspiration of secretions from the trachea and bronchi being undertaken in comatose patients. Under this treatment, the average duration of stay in hospital was only six and one-half days.

The Shift of Diseases in Hospitals.—The extent to which the numerical importance of certain diseases has changed as expressed by admissions to hospital has been studied by Lingjaerde and Römcke (*Tidsskrift for den norske lægeforening* for Jan. 1). Their material consisted of the patients treated in the medical department (140 beds) of a general hospital between 1935 and 1953. This hospital has always had a waiting list of three to four weeks. The average duration of stay in the hospital in recent years has been about 15 days. In the period under review there has been an upward shift in the average age of the patients, and there are now more patients older than 60 years. Since 1935 the frequency of cases of infarct of the heart in the hospital has almost trebled, doubtless to some extent because of the vogue

now enjoyed by anticoagulation treatment, which requires hospitalization in the acute stage. The tendency to diagnose infarct of the heart more readily than heretofore may also account for some of this change. There has also been an upward shift of hypertonia, cardiac insufficiency, and angina pectoris, and there has been both an absolute and a relative rise in the number of patients with lumbago and sciatica. Except for the war years, when the number of mental patients declined, there has been a steady rise in the neurosis rate. Parallel with this rise has been the mounting frequency of cases of poisoning. The frequency of the anemias, diseases of the bile ducts and kidneys, polyarthritis, pneumonia, and thyrotoxicosis has remained remarkably constant. The authors conclude that pressure on the waiting list would be reduced only by about 3% if the hospital could discharge the patients needing only polyclinic treatment. More could be done by providing accommodation elsewhere for the aged and infirmed not requiring the services of a well-equipped modern hospital.

Welfare of the Aged.—In February after investigations lasting about three years, the Health Committee of the Aged issued a preliminary report. The census of 1950 showed that 316,000 persons in Norway were over 65. By 1970 it is estimated that the corresponding figure will be over 500,000, with 328,000 over the age of 70. While in 1950 persons over the age of 65 constituted only 10% of the total population, it is estimated that the corresponding figure in 1970 will be over 13%. The committee recommends cooperation between public and voluntary welfare organizations and the creation in every administrative area of a group specially charged with the care of the health and general welfare of the aged. A note of caution is sounded against any indiscriminate building of old age homes as the main solution of the problem. Care should rather be taken to assure the comfort of the aged in their own homes from which they should not be uprooted prematurely. It is hoped that homes for the aged at present occupied by imbeciles, mental defectives, epileptics, and the like may get rid of such encumbrances so that they may serve the function for which they were created.

PHILIPPINES

New Veterans' Memorial Hospital.—The new 747 bed veterans' hospital in Manila, costing $9,400,000, will be ready to admit patients by the end of October. This hospital was built by funds appropriated by the 80th United States Congress in 1948. The sprawling two story hospital has six operating rooms, seven elevators, six x-ray rooms, and a complete automatic intercommunication system. Each bed will have radio earphones with selective three station switches. The garbage may be refrigerated for any length of time in the kitchen prior to incineration. The sewage treatment facilities (Dorr method) will take care of the sewage of 2,000 persons. There is an air-conditioned movie theater for patients. The hospital carries complete diagnostic and treatment facilities for all services. The tuberculosis service is the largest, followed by the general medical and general surgical services. There will be a 50 bed neuropsychiatric service. The hospital will be run by a board of deans, of which Dr. B. J. Valdes, a retired major general and professor of surgery of the University of Santo Tomas, is the chairman. All duty personnel will be Filipinos who are Army veterans. Operating expenses will be gradually but steadily turned over to the Philippine government so that by Jan. 1, 1960, all United States aid will have been withdrawn.

TURKEY

Effect of Antibiotics on Glanders.—Human glanders in Turkey has invariably been traced to horses with farcy. According to the Ministry of Health and Social Assistance only 18 cases of human glanders, acute and chronic, were reported during the years 1938 to 1948, and all were fatal. The first patient to recover from acute glanders was given streptomycin with supplementary penicillin and sulfadiazine in 1949. There was no relapse, and the patient was still in good health after 18 months. In 1951 another patient with acute glanders was successfully treated with sulfadiazine alone. In 1953 a patient was given chlortetracycline by mouth and streptomycin intramuscularly. He recovered and was still in good health after six months.

In *Dirim* (vol. 29, no. 7-8, July-August, 1954) Drs. Derman and Akman reported the case of a 33-year-old man with glanders. A month previous to admission he noticed red swelling below his right knee. He was febrile, but he had no purulent or bloody nasal discharge. After three weeks a red, painful swelling developed on his right arm. Some of the horses in his village had farcy, including his own. On admission his temperature was 103.6 F, his pulse rate was 128 per minute, his skin and mucous membranes were of normal color. Microscopic examination of the material aspirated from the abscess disclosed an abundance of pus cells but no micro-organisms. His erythrocyte count was 3,600,000 per cubic millimeter and his leukocyte count was 14,000 per cubic millimeter, with 68% polymorphonuclear neutrophils, 16% transitional cells, 15% lymphocytes, and 1% monocytes. His hemoglobin level was 65% of normal. His sedimentation rate was 40. His urinary urobilinogen test was positive, and microscopic examination of the sediment showed a few leukocytes and epithelial cells. The mallein intradermal test was positive after 18 hours. The Ankara Military Veterinary Biological Institute reported that Malleomyces mallei had been isolated from the material obtained by aspiration. The Strauss reaction test of this culture was positive, agglutination was positive at a titer of 1:1,000, and the complement fixation test was 4+. After incision of the abscess the patient received 1 gm. of streptomycin and 15 tablets of sulfamethazine. His temperature dropped to normal within five days and was maintained at this level throughout the rest of the course. As the patient's urine showed many urate and sulfonamide crystals, the sulfamethazine tablets were reduced to eight a day, and he received 1.5 gm. of sodium bicarbonate daily as an adjunct. As a result the urine reverted to normal. When, after a week, a small abscess appeared on the left ankle, the therapy was changed to 1 gm. of chlortetracycline and 1 gm. of streptomycin daily. He received this treatment for 33 days. One gram of streptomycin, dissolved in 10 cc. of saline solution, was infiltrated around the abscess. It disappeared within three days, and the patient's condition improved markedly. During his 64 days in the hospital the patient received a total of 48 gm. of streptomycin, 33 gm. of chlortetracycline, and 128 gm. of sulfamethazine. The latter had no beneficial effect as it did not prevent a new abscess from developing. Just before discharge the Strauss test was found to be negative, the agglutination test was positive in a titer of 1:6,000, the complement fixation test was 4+, and the sedimentation rate was 10. Two months later the patient was still in good health.

Maxillary Sinus Odontoma.—In the *Istanbul University Medical Faculty Bulletin* (vol. 17, no. 5) Shakar and Sarpyener described a maxillary sinus odontoma in a 10-year-old boy. Six months prior to admission the patient had a right superior maxillary dentoalveolar abscess that burst after 15 days. A dentist injected doses of penicillin. The pain and swelling subsided for a short time, but fever persisted, and the abscess reappeared and burst on the outside. On admission the right maxillary region was swollen and a purple-red purulent fistula was seen. The teeth were good, and there was a swelling around one tooth only. Swollen lymph nodes were present in the mandibular region bilaterally. A roentgenogram revealed that the right maxillary sinus was distended to the left and adhering to its lower portion there was a tumor the size of a walnut. The tumor was completely removed; an infected tooth and an adjacent tooth had to be extracted. The sinus was curetted, and 400,000 units of penicillin and 1 gm. of streptomycin were instilled. A drain was inserted, and the wound was closed. The patient's temperature reverted to normal. After a week the maxillary fistula closed, and a week later the wound in the gingival area healed. A roentgenogram showed an empty maxillary sinus. Microscopic examination of the tumor revealed an abundance of cubical epithelial cell colonies and groups in the fibrous tissue and an abundance of homogeneous pink osteite substance and lacunas in the dentine fields. The diagnosis of mixed odontoma was verified.

CORRESPONDENCE

SURGEON AND ANESTHETIST—GOOD AND BAD TEAMWORK

To the Editor:—Dr. Amos R. Koontz, in a letter published in THE JOURNAL, Dec. 25, 1954, page 1628, contended that the anesthetic procedure of endotracheal extubation with suction is an important cause of postoperative hernia. No real evidence was adduced. Even the one instance cited of an improperly timed and performed "tracheal toilet" was not followed long enough to determine that a recurrence of herniation had occurred. Any assumption that the use of atropine, the absence of gross evidence of moisture in the trachea, and the choice of thiopental are assurances against the formation of obstructive tracheobronchial secretions is fallacious. Any experienced anesthesiologist can cite many cases to refute such a contention. The principal arguments in Dr. Koontz's letter are that the procedure of "tracheal toilet" is overdone, ineffective in clearing the lower bronchial passages, and harmful to the surgical wound. Our experience in more than 4,000 "tracheal toilets" disproves these claims. It is our regular practice, at the slightest indication, to cleanse the respiratory passages, particularly when the patient is completely awake and can fully contract his abdominal muscles for an effective cough. We avoid extubating a patient who is lightly anesthetized or "reacting," when a cough is not really effective and undesirable reflex side-effects on circulation and respiration are more frequent and severe. The "toilet" is performed through a nasotracheal tube, left in situ from the time of operation and tolerated by the patient as readily as a Levin tube. The details and results of this practice have been published (Greene, B. A., and Berkowitz, S.: *New York J. Med.* **52**:1871-1878 [Aug. 1] 1952; *Anesthesiology* **14**:166-179 [March] 1953; *New York J. Med.* **53**:1976-1982 [Sept. 1] 1953).

Dr. Koontz correctly stated that tracheal suction is not really efficient in clearing mucus from the deeper areas of the bronchial tree because the catheter reaches only to the trachea or, at most, to the primary bronchi. This is precisely the reason that the anesthesiologist does not depend on what suction yields but insists on obtaining the vigorous cough that tracheal suction induces in all but the most moribund or uncooperative patient. A tracheobronchial "toilet" without induced coughing is of little value; suction through a large-bore endotracheal tube causes only "bucking," a form of disordered and ineffective coughing that does little to prevent postoperative pulmonary complications.

We agree with Dr. Koontz that vigorous coughing strains a wound at any time. For this reason, during extubation, we have an assistant exert firm pressure on the wound, even though this support is probably unnecessary, since a well-sutured incision best resists disruption immediately after closure. We have seen tracheal suction lead to only one wound-separation on the operating table; on resuturing the wound the surgeon observed that an inexperienced assistant had not firmly secured the knots on wire sutures that were found entirely untied. The patient who has persistent secretions, with consequent coughing and other ill-effects, subjects an incision to incomparably greater disrupting forces that frequently continue into the 7th to 10th postoperative day, when most cases of evisceration occur and most instances of incisional herniation probably start. Dr. Koontz's prescription of a narcotic immediately after operation to prevent the struggling that accompanies emergence from anesthesia depresses the cough reflex and thereby interferes with the efficiency of the "tracheal toilet." There are better ways to avoid or minimize excited recovery from anesthesia without returning to a regimen that negates the many advantages of the "stir-up" regimen and early ambulation.

The cause of recurrent or incisional hernia and wound dehiscence is complex. At times the condition seems unpreventable. We have long anticipated such objections as those of Dr. Koontz; we have diligently collected all instances of wound complications originating in our own and other hospitals. Among patients with the most severe morbidity from incisional hernia, recurrent hernia, and dehiscence, a high incidence of antecedent respiratory abnormalities, both before and after operation, is striking evidence of their importance. The anesthesiologist, by preventing or mitigating respiratory complications, decreases rather than increases the frequency of wound complications. The short but vigorous bouts of coughing that we have deliberately induced after wound closure, with the one exception cited, have not been the primary cause of dehiscence. After six years, in which we have consistently followed the practice described above and repeatedly sought critical appraisal, our surgeons encourage the practice of "tracheal toilet" more than ever before. Dr. Koontz aptly states, "surgical anesthesia is an adjunct to surgery and not an end in itself." Surgery too is not an end in itself. Both the surgeon and the anesthesiologist help the patient recover from a surgical condition. This objective is better attained when the anesthesiologist prevents postoperative respiratory complications and correspondingly reduces the likelihood of wound dehiscence, incisional herniation, or recurrence of hernia.

BARNETT A. GREENE, M.D.
SAMUEL BERKOWITZ, M.D.
8902 Avenue A
Brooklyn 36, N. Y.

POTASSIUM INTOXICATION

To the Editor:—There is a possible hazard in giving intravenously massive doses of potassium penicillin to infants or to adults with renal insufficiency. The danger lies not in giving the penicillin anion itself, but in flooding the patient with potassium cation. This problem was called to my attention by an experience with a pediatric patient who was admitted to the San Francisco Hospital. A 10-day-old Negro male infant was admitted to the San Francisco Hospital on the evening of Feb. 8, 1955. He had a high fever, nuchal rigidity, and signs of dehydration. Examination of the cerebrospinal fluid revealed polymorphonuclear leukocytes and gram-positive diplococci. A diagnosis of pneumococcic meningitis was made tentatively, pending culture of the organism, and therapy was started with parenterally given fluid, electrolyte, and penicillin. On admission, the patient weighed 3.3 kg. (7 lb.). An intravenous infusion flask was prepared with these constituents: water 500 ml., sodium 32 mEq., potassium 1 mEq., bicarbonate 7 mEq., calcium 0.75 mEq., chloride 25.25 mEq., glucose 12.5 gm., and potassium penicillin G 10 million units. It was planned to infuse the contents of this flask during a 24 hour period. The patient was also given an intramuscular injection of potassium penicillin G, 2 million units (Alexander, H. E.: *J. A. M. A.* **152**:662 [June 20] 1953).

During the night, the patient had a considerable diuresis. Early the next morning his temperature was normal, but the patient had a tonic-clonic convulsion. Serum drawn at that time showed 128 mEq. of sodium per liter and 6.5 mEq. of potassium per liter. The specimen was thought to have been partially hemolyzed, and the potassium value was disregarded. An additional 16 mEq. of sodium was given to correct the hyponatremia. The patient continued in a stuporous state, with occasional minor convulsive movements. From time to time, he lapsed into the Cheyne-Stokes type of respiratory pattern. On the evening of Feb. 9 administration of a second flask was started. This contained: water 400 ml., sodium 26 mEq., potassium 0.8 mEq., calcium 0.6 mEq., bicarbonate 5.2 mEq., chloride 22.2 mEq., glucose 10.0 gm., and potassium penicillin G 5 million units. Throughout the second night the patient continued stuporous and breathed in the Cheyne-Stokes pattern. On the morning of Feb. 10, examination of his serum revealed 140 mEq. of sodium per liter and 5.5 mEq. of potassium per liter. Later that day, it was first appreciated that the patient had been receiving large quantities of potassium in the form of penicillin. At this point, the infusion flask was replaced by another containing similar electrolytes but only 1 million units of potassium penicillin. Within an hour, the patient's condition improved strikingly; he opened his eyes, moved his limbs "purposively," and made sucking movements. That evening, he was able to take oral feedings.

It was calculated that the antibiotic preparation contained roughly 1.75 mEq. of potassium per 1 million units. On this basis, we estimated that the second flask contained 9.55 mEq. of potassium in 400 ml. of water, a concentration of 23.9 mEq. of potassium per liter. Analysis, by flame photometry, of an aliquot of that fluid revealed a concentration of 23 mEq. of potassium per liter. In retrospect, it was found that the patient had unwittingly been given nearly 30 mEq. of potassium in two days. It was estimated that this was approximately seven times his total extracellular store of potassium and 15% to 25% of his total body potassium. His survival was, apparently, a consequence of prodigious renal excretion of that cation. Since penicillin alone is a relatively innocuous drug, it is conceivable that physicians may be tempted to give enormous doses. On the basis of my experience, which fortunately had a happy outcome, I caution them to be mindful of the relatively large potassium content of preparations for parenteral administration.

EDWARD MESSNER, M.D.
Intern, Stanford University Service
San Francisco Hospital
San Francisco 10.

PSYCHIATRY IN MEDICINE

To the Editor:—May I add another aspect to the controversy so ably described by Dr. Kubie in THE JOURNAL, Jan. 29, page 466? Let me start by amending the title of the problem to "Psychology, Psychiatry, and Medicine" instead of limiting it entirely to the psyche. Dr. Kubie's plan for creating an intermediate profession was devised because of the need for psychotherapists—and I agree that the average internist is not adequately trained for such work—but I wonder if all the means of providing such training have been adequately explored?

Many internists, whose medical school graduation date obviated the need for residency training, have nevertheless been trained on the postgraduate level. Attendance at special courses, clinic work, and hospital ward service have enabled them to meet the rigorous demands of the American Board of Internal Medicine. I doubt if anyone can seriously question their ability, despite the current differences in training that are now demanded of more recent graduates. Some of these internists, not content with a unilateral orientation, have similarly desired training in dynamic psychiatry so that they can do a better job in the comprehensive and total care of their patients, but here they have been stopped by the requirements that demand a residency in psychiatry before they can be admitted to any but the most elementary courses in psychiatry. The many psychiatric facilities in the big cities, many of which are said to be inadequately staffed, could train these internists by providing ward service, where both aspects of the patient could be treated by a mixed staff. In this truly psychosomatic setting, everyone could profit, especially the patients. I fully realize that a completely trained psychotherapist would not emerge, judging from Dr. Kubie's standards, but perhaps even he can be too perfectionistic. Would not the result be better than the present inadequate situation? I believe that this hybrid medico, call him "psychosomatist" if you will, but he is nevertheless a doctor, can do a good job. He will steadily improve, reaching maturity in less time than it takes (25 years) to produce this new generation of doctors of psychology, who, despite adequate psychological training, will still be legally unable to meet their patient's total needs.

The dissection of the human body into psyche and soma has gone on since the days of Plato, and probably earlier. From all indications it will continue, but mature physicians in the meantime have always treated both simultaneously. Perhaps their "art of medicine" has been unconscious; if so, it can be made conscious by postgraduate training, so that these physicians can do an even better job. Closing the door to their growth and development is not the answer, certainly not when it comes from those whose daily task is to promote growth. Forcing them to retreat and regress to a residency level is hardly the solution, especially if they are full grown, nonschizophrenic, and are anxious to want to remain as "total" physicians.

WILFRED DORFMAN, M.D.
1921 Newkirk Ave.
Brooklyn 26, N. Y.

RABIES

To the Editor:—In the Feb. 5 issue of THE JOURNAL, page 518, there was reported a case of a 5-year-old boy, hospitalized with convulsions and acute respiratory distress Dec. 23, who died two days later. Upon investigation it was found that a stray dog, proved later to have been rabid, had been seen in the child's yard and that the child had contracted rabies through an open wound on his toe. This is entirely at variance with my past experience and studies during the last 35 years, as I had regarded such a thing as being outside the realm of probability. As reported, there is still room for considerable doubt. To me it is very important to know whether or not rabies can be contracted in such a manner, for if I were consulted by a patient under similar circumstances regarding the advisability of taking the immunization injections, I should unhesitatingly advise against it. In reviewing dozens of papers on the subject, and in numerous discussions, it would seem that this case is unique. Another unique one was presented in THE JOURNAL several years ago in which the patient was said to have contracted rabies from contact of a portion of his crib with his mouth after a supposedly rabid dog had been around. I never could determine the final opinion as to the exact diagnosis of the cause of death.

F. C. HODGES, M.D.
Suite 800, First National Bank
Huntington, W. Va.

RAPID TEST FOR UREMIA

To the Editor:—In the Feb. 26, 1955 issue of THE JOURNAL, page 719, W. T. Caraway describes a "Rapid Turbidity Test for Diagnosis of Uremia" and refers to the spot test by Patterson (*Lancet* **1**:1061, 1934) that was found unsatisfactory. In 1942, with Plotz and Reich, I devised (*J. Lab. & Clin. Med.* **28**:335, 1942) a modification of the Patterson spot test performed by dropping Ehrlich's aldehyde reagent (*p*-dimethylaminobenzaldehyde "Kodak" 0.5 gm., trichloracetic acid 100 gm., distilled water up to 100 ml.) on filter paper, placing a drop of blood on the still wet surface, and drying the paper over a desk or microscope lamp. A positive reaction in the presence of blood urea nitrogen levels of more than about 50 mg. per 100 cc. is indicated by a distinct yellow zone diffusing around the brown spot of coagulated blood. This test proved simple, speedy, and sufficiently accurate in our hands (*J. Urology* **51**:85, 1944).

HANS N. NAUMANN, M.D.
Chief, Laboratory Service
Veterans Administration Center
Jackson, Miss.

IRRITATION BY COSMETIC INGREDIENTS

To the Editor:—I am at present engaged in a revision of my book "Cosmetic Materials: Their Origin, Characteristics, Uses and Dermatological Action," the foreword to which is being contributed by a Harley Street dermatologist. In the interests of the industry, the user, and the medical profession, I am anxious to obtain as much information as possible concerning primary irritation or sensitization arising from the use of substances employed in the cosmetic, toilet, and pharmaceutical industries, and for this purpose I would like to receive brief details from any of your readers of any instances in which the offending ingredients have been definitely confirmed by skin tests. Such information will be personally acknowledged, and full credit will be given to the source in the new edition.

RALPH G. HARRY, F.R.I.C. (Foods and Drugs)
60, Broad Walk, Heston, Middlesex, England.

FOGGING OF GLASSES

To the Editor:—I read in THE JOURNAL of March 12, 1955, page 171, about a simple remedy for foggy glasses by Dr. L. L. Garner. I am using for this purpose regular soap. I rub gently both surfaces of the lens with a dry cake of soap and then polish it with a dry cloth. The glass remains clear and does not get foggy.

EDMUND CARTER-ROSENHAUCH, M.D.
30 E. 60th St.
New York 22.

GOVERNMENT SERVICES

AIR FORCE

Foreign Medical Officers Visit Aviation Medical School.—Twenty-seven medical officers from 25 nations friendly to the United States visited the School of Aviation Medicine at Randolph Field, Texas, late in March, where they were welcomed by Brig. Gen. Edward J. Kendricks, commandant of the school. The medical officers inspected the research laboratories and were briefed on aero medical procedures in the U. S. Air Force. They were shown the planes and equipment used in the transfer of sick and wounded from the combat areas overseas to medical centers at home, as well as the air rescue helicopters and the lightweight "iron lung" developed by the school for transport of poliomyelitis patients. After attending church services in the Randolph base chapels, they took off for Wright-Patterson Air Force Base in Dayton, Ohio, before returning to their own countries. Among the officers were 13 surgeon generals of other air forces, including those of France, China, Egypt, Spain, the Netherlands, Indonesia, Finland, India, Korea, the Philippine Islands, Colombia, Syria, Rhodesia, and Nyasaland. Other countries represented were Chile, Thailand, Australia, Norway, Sweden, Uruguay, Yugoslavia, Belgium, Brazil, and Switzerland. Major Gen. Dan C. Ogle, Surgeon General of the U. S. Air Force, and others accompanied the group.

ARMY

Briefing on Care of Mass Casualties.—Sixteen educators from 12 medical colleges arrived at Brooke Army Medical Center March 10 to study care and treatment of mass casualties. The visitors, members of the Medical Education for National Defense committee, were welcomed by Major Gen. William E. Shambora, center commander.

Primary mission of the visit was briefing in Army medical procedures in order to incorporate certain military instruction in medical school courses. The MEND program stresses the teaching of national defense emergency procedures through the established curriculums of the nation's medical colleges. Particularly aware of the need for doctors trained in mass casualty care, the committee is interested in teaching to medical students techniques that can be applied in event of any disaster involving large numbers of persons. It is anticipated that by 1960 the program will have been expanded from 50 to 81 colleges.

Reservists to Receive Credits for Attending A. M. A. Meeting.—Point credits for retention and retirement may be earned by Reserve Medical Corps officers on inactive duty who attend the Military Medical Section of the Annual Meeting of the American Medical Association, June 7-9, in Atlantic City, N. J. The Department of Defense authorization covers all eligible physicians of the Army, Navy, and Air Force Reserves. Those who attend the scientific session for more than two hours will be awarded one point credit toward retirement. Scientific subjects scheduled for discussion by civilian and military authorities include handicaps and motivation, automobile accidents, effects of fallout radiation, effect on the public of breaking the sound barrier, use of whole blood in military and civil defense emergency, psychological reactions in mass casualties, and modern concepts in the treatment of burns. For details of the program see THE JOURNAL of April 23.

New Reserve Corps Brigadier General.—Dr. Manfred U. Prescott has been promoted to brigadier general in the Army Medical Corps Reserve, the Surgeon General has announced. His interest in Army medicine began in 1918 when he joined the Student Army Training Corps at the University of Illinois. After completing an internship, he accepted a commission as a lieutenant in the Medical Corps Reserve in 1925. In 1935 he was designated as a flight surgeon. From September, 1941, through December, 1944, he served successively as post surgeon at Merced, Calif.; Army Air Corps School, Truax Field, Wis.; and Scott Field, Ill. He is now in private practice in San Francisco and Oakland, Calif., and active in affairs pertaining to military medicine.

First James Stevens Simmons Memorial Lecture.—In recognition of the contributions of Brig. Gen. James Stevens Simmons in the field of military preventive medicine, the Surgeon General, Major Gen. George E. Armstrong, has authorized the establishment of an annual lecture in honor of the late General Simmons (see THE JOURNAL, Aug. 21, 1954, page 1511). The first memorial lecture in this series will be given by Dr. John Dingle, Professor of Preventive Medicine, Western Reserve University School of Medicine, Cleveland, on respiratory disease research and military preventive medicine, at 8:00 p. m., April 21, in the Sternberg Auditorium at the Army Medical Service Graduate School, Walter Reed Army Medical Center, Washington, D. C.

Physicians Having Military Service Obligations.—A physician presently interning or in residency who has obligations for military service and desires to enter on active duty in July, 1955, should request the necessary application forms immediately from the Surgeon General, Department of the Army, Washington 25, D. C., attention MEDCM-PA. To avoid delay, prompt action by the applicant is imperative, for it takes several months to obtain a reserve commission. The physician who is already commissioned and wishes to enter on active duty next July should so advise the Army headquarters from which he received his commission or the Army Surgeon General.

NAVY

Physician Wanted.—The U. S. Naval Ammunition Depot, Crane, Ind., has a vacancy for the position of medical officer, GS-11, at $5,940 per annum plus overtime, and part-time private practice in nearby housing projects is available. Applicants must be graduates of a medical school of recognized standing with the degree of doctor of medicine, must have completed an approved full rotating internship, and must be currently licensed or able to obtain a license to practice medicine and surgery in Indiana. Applications should be sent to the Civilian Industrial Relations Director, U. S. Naval Ammunition Depot, Crane, Ind.

VETERANS ADMINISTRATION

Hospitals at Long Beach and Tucson.—The Veterans Administration announces that the President has approved two major hospital construction projects at the VA hospitals in Long Beach, Calif., and Tucson, Ariz. The Long Beach project calls for the replacement of temporary hospital buildings, and the Tucson project provides for a clinical addition. The 1,600-bed Long Beach hospital was built by the Navy in 1943, and it is largely of temporary, nonfireproof construction.

Congress last year added 8 million dollars to the VA budget for the replacement of the temporary buildings. This will finance the first phase of the project, and it was this phase that the President approved. The first phase calls for the construction of a new building that will provide 561 beds (including 205 for paraplegic patients). It also includes construction of a new surgery unit, a central supply service, a therapeutic pool for paraplegic patients, and numerous other related facilities. The second phase, which still remains to be approved, calls for the construction of another permanent building and alterations and adjustments to the existing permanent structures.

The Tucson hospital project provides for the modernization of existing clinical facilities for outpatient care and for x-ray, laboratory, dental, and central sterile supply services. This hospital is a 402-bed tuberculosis institution with facilities for treating neuropsychiatric and general medical and surgical patients.

Hospital News.—Dr. Sandor Rado, director, Psychoanalytic Clinic for Training and Research at Columbia University, addressed the hospital staff of the Veterans Administration Hospital at Northport, N. Y., March 29, 1955, on "depressive reaction."

LAW DEPARTMENT

MEDICOLEGAL ABSTRACTS

Hospitals, for Profit: Liability for Injury to Mentally Deranged Patient.—Plaintiff sued the defendant corporation for negligently causing the death of her husband. From judgment favoring plaintiff, defendant appealed to the court of appeals of Tennessee.

The defendant maintains and operates the Madison Sanitarium and Hospital for profit. The hospital holds itself out as equipped to care for mental patients. The plaintiff's husband was admitted to the hospital suffering from emphysema, a stomach ulcer, and a deranged mind; his mental condition was such that he had insane delusions. The patient's personal physician told those in charge of the hospital about the patient's condition and that he would have to be placed on the ground floor and watched, or otherwise he might harm himself. He remained in the hospital for two weeks when he was taken home. He was readmitted about three weeks later by the authority of Dr. Schuler, a member of the defendant's staff. Dr. Schuler was not at the hospital when the patient reentered, but he had left the following instructions for the care of the patient: "Low bed, sideboards, and restrain if necessary. Soft diet." The patient was placed in a second floor room at about noontime. Plaintiff and her daughter remained with him until about 2 p. m. After they left the patient became very restless, roamed all over the second floor disturbing other patients, and smoked cigarettes excessively. He apparently was suffering from delusions or at least was extremely confused; he expressed a fear that he was going to be operated on and said that he wanted a cab to be called for him; he also claimed he had received a telegram from his father, who had been dead for 20 years. In general the nurses and aids on that floor were unable to control his actions. The patient had not been placed in a low bed with sideboards, and no restraints were used to keep him in bed. At about 6:30 p. m. the patient either fell or jumped out of the window of his second floor room. The fall caused his death. At the trial the medical director testified that he saw the patient during the afternoon and at the time considered either moving the patient to another section of the hospital or tying him in bed, but that he decided to do neither. Also the evidence showed a conflict as to whether or not hospital officials told plaintiff that she could get a special nurse to attend her husband. In any event she did not do that.

The court of appeals pointed out that: "A private hospital owes a duty to give its patient such reasonable care and attention for his safety as his condition may require; and it must use reasonable care to safeguard him against any known or reasonably apprehended danger to himself due to his mental derangement." The court held that even if the plaintiff had declined to hire a special nurse to attend her husband this would not excuse the defendant from exercising the care it was obligated to furnish its patient; and that under the facts of this case the jury could conclude that the defendant had failed to exercise such reasonable care as to the deceased. The court further held that the defendant could not avoid its responsibilities merely because the medical director decided not to move or to tie the patient to his bed. In light of the patient's behavior in the afternoon, the jury was justified in finding that the nurses and doctors did not act reasonably in not restraining the patient for his own safety.

Accordingly, the court of appeals affirmed the judgment in favor of the plaintiff. Certiorari was denied by the Supreme Court. *Rural Education Association v. Anderson, 261 S. W. (2d) 151 (Tenn., 1953).*

Medical Practice Acts: Disciplinary Action for Contempt of Congress.—The petitioners were subjected to disciplinary action under the New York Education Law by the board of regents. The action of the board was reviewed and affirmed by the New York supreme court, appellate division. Petitioners then appealed to the Court of Appeals of New York.

All three petitioners were physicians licensed to practice medicine in New York. Having been members of an association known as the Joint Anti-Fascist Refugee Committee, petitioners were served with subpoenas *duces tecum* by a federal congressional committee. Petitioners ignored the subpoenas and consequently were indicted and convicted pursuant to federal law for contempt of Congress. Each of the petitioners paid a fine and served a period of imprisonment. The instant proceedings were brought in pursuance to the New York Education Law that provides for disciplinary action against a physician who "has been convicted in a court of competent jurisdiction, either within or without this state, of a crime." The petitioners contended that the pertinent statute should be construed to include only crimes that were crimes at the time in New York; that the word crime should be limited to only those crimes either involving moral turpitude or reflecting on one's professional status; and that the board of regents imposed unwarranted sanctions and considered prejudicial matter in fixing the penalties.

The court of appeals rejected the first two contentions of petitioners for the same reason: that is, the two suggested constructions of the statute would require the court to read words into the statute so as to give it a limited meaning, whereas the words expressed by the legislature do not warrant such limited meanings. The court further stated that while the statute had a very broad effect in that it made possible a penalty for acts that would not constitute a crime under New York law, still it did not deem the statute to be unreasonable. The violation of the penal laws of any state, said the court, has some reasonable relation to the violator's character. As to the third contention, the court held that under New York law its power of review in cases of this nature does not extend to questions of the appropriateness of the board's decision and the manner in which the board conducted the hearing. These were matters of administrative discretion that could only be reversed if there was an error of law. None was shown to exist in this case.

Accordingly, the action of the appellate division affirming the disciplinary action against the petitioners was affirmed. *Barsky v. Board of Regents of University of New York, 111 N. E. (2d) 222 (N. Y., 1953).*

Drunkenness: Admissibility in Evidence of Chemical Tests for Intoxication.—The defendant was tried and convicted of the crime of driving a motor vehicle while intoxicated. He appealed to the court of criminal appeals of Texas.

After his arrest the defendant signed a written consent to an intoximeter test. A police officer used an instrument to capture a sample of the defendant's breath and delivered it to Dr. Morton F. Mason, professor of pathological chemistry at Southwestern Medical School. Dr. Mason determined that such sample showed the alcoholic content of the defendant's blood at the time was 0.275% alcohol by weight. At the trial Dr. Mason stated that in his opinion defendant must have been intoxicated. As a basis for his opinion, Dr. Mason stated that he relied on the findings of the American Medical Association and the National Safety Council to the effect that intoxication exists when the alcohol content of the blood by weight is greater than 0.15%.

On appeal the defendant argued that in proving he was intoxicated the state simultaneously proved that he was not capable of signing a consent to having a breath specimen taken from him. On the other hand, the state argued that if the defendant claimed he was too intoxicated to give his consent he simultaneously admitted his intoxicated condition. The court solved the riddle by pointing out that one may be intoxicated within the meaning of the penal statute without being so intoxicated that he could not legally give his consent to an act. It was the burden of the defendant to prove intoxication to the latter degree, and, since he did not try to establish the fact, the consent would be treated as valid. The defendant also urged that it was error to permit Dr. Mason to give his opinion as to intoxication since he admitted that he based the opinion on findings made by the American Medical Association and the National Safety Council. The court held that such an opinion by an expert was admissible under the rule that an expert witness may state the conclusions reached in authoritative sources as corroborative of his own opinion. The court also held, contrary to the defendant's contention, that it was not necessary to introduce into evidence the intoximeter for inspection by the jury. All that need be done was to have qualified witnesses testify as to the taking of the test and the result determined therefrom.

Accordingly, the court affirmed the defendant's conviction. *Jones v. State, 261 S. W. (2d) 161 (Texas, 1953).*

MISCELLANY

SCIENCE VERSUS LIFE

A. J. Carlson, M.D., Chicago

Can the factual understanding of the nature and the history of man and the universe produced by modern science aid man towards a saner, a happier, and a richer life; that is: more intelligence and less violence? Our ancestors had very little factual, that is, scientific understanding of man and nature for some 500,000 years. Modern science did not appear until yesterday, and, as we shall see, has not yet reached the brains of most of our fellow men all over the world. But science could be an aid towards a saner future for all men.

When the hurricane strikes ships at sea, frail hulls founder, while the crew of sturdier crafts experience anxiety, if not panic, and are for a time deflected from their course by the temporary violence of wind and waves. But they ultimately make their goal, thanks to human courage, the compass, and the fixed stars. Such hurricanes, man made, have struck human society, and its institutions, from time to time throughout recorded history. We call them war. The world is now in the midst of one such period of fear and violence, labeled "the worst"; because human memory is short, and even yesterday's experience is less vivid than that of to-day. There is anxiety and fear, if not panic on board. When storm clouds cover the heavens men of little understanding question the compass of science, fear that the stars of rectitude will guide no more, and with scant hope drift with the violent wind. The compass of science is not only questioned, but it is charged that this very compass has led us into the hurricane, that science is in conflict with society. Is it science and the scientific method that lead nations into war? A British scholar said: "In Europe to-day it is rather dangerous to ask questions, it is much safer to discuss how a question should be asked." To-day this danger is by no means confined to Europe. But as I read the human record in mud, and rocks, and ancient ruins, on tablets of clay, in scratches on stones, papyrus and paper, I think I discern evidence of the ascent of man, through asking all kinds of questions at all times, and seeking the answers by the best methods of the age. If we do less, we admit that science and civilization is a blind alley in human evolution.

AGE OF SCIENCE

Is ours the Age of Science? Or rather, in what sense is ours the Age of Science? An eminent physicist recently said: "In no previous time in human history has life and thinking been so greatly influenced by science as it is to-day." This is undoubtedly true, but does that alone make ours the Age of Science? I think not. Those who, accusingly or proudly, describe our times as the Age of Science usually cite as evidence the modern aspects of man's inhumanity to man, or the numerous practical applications of the discoveries in physics, chemistry, geology, biology and medicine during the last hundred years, such as the steam and gas engines, the telegraph, the telephone, the airplane, the radio, modern surgery, fair control of infectious disease, modern sanitation and many other inventions and measures that contribute to the convenience, the efficiency, the health, the comfort and the happiness of modern life. It is true that science has, during the last hundred years, increased enormously our understanding of the nature of the world and the nature of man, and with that greater understanding has come greater control of the forces that act in man and in his environment. But fundamental discoveries in science are the achievements of but a few people. The practical inventions based on these discoveries are also the work of a few men, relatively speaking. And the physical and chemical inventions are mostly gadgets that merely modify our tempo and external mode of living. I contend, and I think I will be able to prove to you, that the great mass of the people of our age, the rank and file of men and women of our day, even in the most enlightened countries, in their thinking and in their motivation are nearly as untouched by the spirit science and as innocent of the understanding of science as was the "Peking Man" of a million years ago. The modern man adjusts to an environment greatly modified by the scientific efforts of the few. The "Peking Man," we may assume, adjusted himself as best he could to nature in the raw. A span of about a million years separate the two. And yet the two are about equally innocent of science, in the sense of the spirit and the method of science as part of their way of life. For science is more than inventions, more than gadgets, however useful and important they be. Science is even more than the discovery of and correlation of new facts, new laws of nature. The greatest thing in science is the scientific method, controlled and rechecked observations and experiments, objectively recorded with absolute honesty and without fear or favor. Science in this sense has as yet scarcely touched the common man or his leaders. The character of human society in any age is determined by man's thinking, motivation and behavior rather than by external gadgets. The erroneous assumption that ours is the Age of Science, or the very limited sense in which this is true, has led many people to charge to science some of the follies and failures, some of the violence, the brutalities, the suffering, the confusion throughout the world in recent years. Some of these people tell us that "science has failed," that we should declare "a moratorium on science." As if we now understand all things; as if real understanding is harmful; as if we should seal the book of scientific knowledge of to-day against the generation of tomorrow. People who talk thus, who advise thus can not understand either the spirit or the method of science. We can not afford to declare a moratorium on honesty, on integrity, on objectivity, on experimentation, for that would take us straight back to the jungle. The way of science is away from the jungle, away from its violence and fears. If the way of science at times, such as the present, seems obscure and even dangerous, that is due to too little, not too much understanding, of the nature of man and our universe, and to the further fact that we do not, or are not permitted to follow the light of science we now possess.

If our age is "The Age of Science," our rulers, our legislators, our businessmen, our educators, our farmers, our factory workers should give evidence of comprehending, using and following the scientific method. The Dean of Canterbury said recently: "Our social and economic order is neither scientific nor Christian. When I read, as a headline in the *Observer* that Poland's good harvest was a severe blow to recovery, I recalled the words of an American professor of agriculture after seeing ten million acres of cotton ploughed under and five million pigs slaughtered: 'If this will bring national prosperity, then I have wasted my life.' The thing is monstrous, an age when science is frustrated." In the broader field of human relations, what do we see on the horizon? Conspicuous, certainly, are these: greed, force, faith and war. These are certainly more conspicuous than the ways of reason based on scientific understanding. In the last analysis, war is murder and stealing on the part of somebody. War is the extension of the practices of the jungle into modern life. The technique of modern warfare is modified by scientific discoveries, but the elements that make for war are certainly not scientific. Hence the persistence of war can not be laid at the door of science. It is due rather to the failure of science and conscience to as yet essentially modify human conduct. For we must assume that sooner or later reason based on understanding will modify human behavior. Even animals with no cerebrum can be conditioned. But, lest we go too far in this optimistic dogmatism, let us also remember that while we have "tamed" the dog, we have not yet "tamed" the tiger.

SCIENTIFIC METHOD

The scientific method demands that we suspend judgment until we know the facts. It demands honesty, integrity and industry in ascertaining the facts. The scientific method and dishonesty are incompatible. But scientists are but human beings, and they frequently make mistakes both in facts and their interpretations. Now, is our age conspicuous for honesty and integrity? Is there less lying and deceit locally, nationally, internationally, to-day than yesterday? The answer is all about us. Modern propaganda, and a good deal in modern advertising, have the earmarks of lying as a fine art, rather than the character of honesty, ob-

From the Department of Physiology, the University of Chicago.
Read before the Chicago Literary Club, Feb. 14, 1955.

jectivity, truthfulness and accuracy of science. It is, biologically, evident that we will have to live with greed for some time to come but the more serious question is: Can human society survive without individual, social and national guile? If the answer is "No," we probably have here the most fundamental conflict between the scientific method and society. Even primitive man learned gradually that robbing, injuring, or killing his fellow men was harmful and hence wrong. If these acts are carried out by a tribe or a nation does that make them beneficial and therefore right and just?

Science, in spirit and method, knows no political aspects or national boundaries. Individuals of all races and nations have contributed to our present understanding of the nature of man and of the world. There is no Democratic logic, Republican mathematics, Nazi physics, Fascist chemistry or Marxian biology. The spirit and the method of science can not change with capitalism or socialism. This appears to me axiomatic. But fanaticism in society and governments can temporarily retard discovery and further advance in the understanding and control of life and nature. And yet we heard claims from the Nazi Germany of a special Teutonic or Nazi physics, claims from Russia of something called Marxian genetics. These stupidities characterize our age, but they are not the characteristics of science. If the science of modern biology has made out anything with a high degree of certainty, it is the fact of the essential unity of our present human race, and that such differences as the skin color, hair color, speech, size of body, etc., are not in any way fundamental. And yet notions of racial superiority and inferiority are widespread—as if the difference in skin color, size of lip or length of nose had any significance when it comes to the capacity of the brain or the control of the emotions. An able American anthropologist wrote: "There are no measurable physical or social qualities which are in any given group (of people) superior or inferior." There are, of course, great differences in the kind and quantity of education and in the mechanical appliances due to science among the different peoples of the earth.

If even our so-called educated fellow citizens were scientific their conduct would be more influenced by proven facts than by wishful thinking. At the Century of Progress Exposition in Chicago, the Adler Planetarium had a record attendance. So had the shops of the astrologers and fortune tellers on and near the exposition ground. If there is anything that has been proven to the hilt in biology and medicine during the last hundred years, it is the effectiveness of vaccination against smallpox. There are no ifs and ands about it. It is one hundred per cent effective, and practically one hundred per cent safe. Of course, wherever human hands, human agencies, are involved accidents will happen sometimes. We can't do much at present, to prevent colds, pneumonia, cancer, diabetes or too high blood pressure, but we can prevent the deaths and the disabilities from smallpox by protective vaccination in early infancy. And in most cases the immunity thus conferred lasts throughout life. Despite all these facts, men and women in this and other civilized countries neglect and oppose vaccination against smallpox. We have large groups of people organized into "anti-vaccination societies." And these are not all ignorant people. Some are college graduates. If these people walked in the way of science, they would accept and be guided by proven facts. In ancient Greece epilepsy was called a "sacred disease." But several hundred years B. C. a Greek physician wrote: "Epilepsy is not any more sacred than any other disease. It has a natural cause. Its supposed divine origin is due to man's inexperience and his wonder at its peculiar character." Cotton Mather did not approve medical aid to people with syphilis, because in his day that disease and other diseases were "God's punishment for man's sin." But we do not have to go that far back. In some parts of the world there are religious taboos against prevention of trachoma, a serious infectious disease of the eyes. When the bill was up before the State Legislature in Springfield, Ill., to require the instillation of dilute silver nitrate into eyes of every new-born child in our state, to prevent infantilic blindness from venereal eye infection from the infected mother, a citizen committee came and asked me to go with them to Springfield and help them to defeat that bill. They told me: "There is no such disease as syphilis and gonorrhea, that is all in the imagination."

BIOLOGIC RELATIONS

The exact biologic relations of man to other animals are still, in part, a matter of theory. Animal evolution is usually slow. Most of what we see of it to-day took place in the past. We can only dimly observe the past; we can not experiment with it. Animal evolution is probably now going on, but so slowly that we usually fail to discern it. But the essential identity of the structure and function of tissues and organs in man and animals is not a theory. It is a proven fact. The heart, the liver, the stomach, the lungs, the blood, the eyes, the ears and even the brain are made up of the same stuff, and subjected to much the same diseases, wear and tear and aging in man and animals. It is also true that practically 90 per cent of the understanding gained in the last hundred years of preserving health and controlling disease has been secured through experiments on animals. And yet people, even in civilized countries, oppose experiments on animals as futile and cruel, as of no benefit to man. These people are not all ignorant. But they surely are no scientific. They do not accept, they are not guided by proven facts. Their thinking and motivation have not been touched by the spirit and the method of science. Moreover, the majority of people in some of our states, through their legislatures have passed "anti-evolution" laws, as if the course of events of the past could be altered by legislative dicta of to-day. The legislatures of Tennessee, Ohio or Kansas might pass laws against floods, drought, dust storms, grasshoppers and similar catastrophes, but that would be both futile and unscientific.

It is still a common practice of man, so-called civilized man, to follow post-hoc reasoning; that is, because one event may sometimes follow another, the two events are therefore necessarily causally related. Mankind as a whole, and even leaders in business, industry and government, do not yet thoroughly understand or follow the principle of control, the principle of experiment. Post-hoc reasoning is one of the commonest sins against the scientific method, and we still see it occasionally in those who should have been trained in science; for example, modern physicians. As an example of post-hoc reasoning in medicine, I can cite the case of a physician who had practiced medicine honestly, if not intelligently, in a far western state for forty years. A number of years ago, he told me in all seriousness that he had discovered a specific remedy for influenza. I was naturally curious, because influenza is one of the maladies which has so far largely defied modern scientific control. On being asked what his remedy was, he replied, "Good whiskey and plenty of it." The doctor was apparently perfectly sincere about it. When I asked him how many influenza patients he had treated without whiskey and how many of these recovered, he looked at me in surprise and said: "You understand, I have treated every one of my influenza patients with whiskey during the last forty years, and I have had a high percentage of recovery." This physician, though stupid, was too honest and venerable to poke fun at. Another example is that of another honest physician in a southern state using a remedy whose virtue if any, was essentially 20 per cent alcohol, a so-called female tonic, a southern counterpart of Lydia Pinkham's well-known vegetable compound. The case was that of a young girl working twelve hours a day in a factory in a southern city at low pay. She lived in a garret room, with poor food and poor sanitation. She had a high degre of anemia. The doctor wrote: "I took this girl out of the factory, sent her to the country for three months with relatives and gave her this female tonic. After three months she had nearly recovered from her anemia, thanks to this tonic." It is not surprising that even physicians fall into this error or reasoning, because in the not distant past medical education was only partly scientific and physicians are only human.

IS SCIENCE IN CONFLICT WITH SOCIETY?

To what extent or in what sense is science in conflict with society? I think there is much confusion, misunderstanding and unwarranted generalizations on this point. Not so many years ago the American Association for the Advancement of Science declared, by resolution: "Science is wholly independent of national boundaries, and races, and creeds and can flourish only where there is peace and intellectual freedom." This position is clearly in conflict with the cyclical psychosis exhibited by homo sapiens, in mass, throughout the ages. But whether there is a conflict of science with the primary interest and ultimate well-

being of society is at least an open question. Recently an outstanding physicist declared: "Science makes man human." I presume our colleagues meant that science tends, or should tend, to make man more human. The possible conflict between science and society in this statement obviously depends on our conception of what are the desirable human qualities, or behaviors, to-day and tomorrow. If these are deceit, violence and war, there is conflict between science and society, for deceit, violence and war are the very antithesis of the scientific method. Not long ago a colleague said: "Here on this continent where science has achieved its greatest application, science is in conflict with society. Science and technology have gone so far that the present social structure is facing its debacle. Nowhere else in the world to-day is science in such militant conflict with the social structure under which science survives." The same author also speaks of the "prostitution of science for war." We have here, clearly, a confusion of science and the scientific method with these uses, largely by a non-scientific society, of the understandings and the gadgets developed by the methods and the applications of science, for satisfaction of the ancient human drives of greed, hate and vanity. The modern use of scientific gadgets and forces for violence and war is not essentially different from the ancient use of the hand, the teeth, the rock, the stick and the club in similar drives by our primitive ancestors.

A President of the United States addressed a letter to the president of the Massachusetts Institute of Technology, calling upon the engineering profession to "cooperate in designing accommodating mechanisms to absorb the shocks of the impact of science on society." It seems to me that here, again, we have a confusion of the scientific method and science with technology, and an identification of science in general with the scientific achievements in chemistry and physics. Is it not the technology developed through the latter achievements with which our President was concerned? Evidently the President, though he said so, did not really mean science in general or the scientific method, for if our fellow citizens really are shocked by new data, new generalizations, new uses and controls of matter and energy, new understandings of man and the universe brought forth by science, what kind of shock absorber would he suggest against such new knowledge, and would he not agree that those who are shocked by new understandings should be so shocked? For instance, what kind of shock absorber for society may we look for in the matter of the biologic and medical sciences and the services of modern medicine, especially in prevention and control of infections and the application of modern knowledge of nutrition? To be sure, society once appeared to be shocked by the theory of the evolution of life, and the growing evidences of the unity of all life. These facts do disturb some people, but in my judgment that disturbance is wholesome for society. However, the science of modern biology and medicine certainly helps to preserve and to prolong the life of the ablest as well as the least fit members of society, least fit physically and mentally. Biology and medicine have also greatly increased the average life span, so that to-day society has a greater percentage of members past fifty, sixty and seventy years. To be sure, modern warfare tends effectively to counteract this "impact" of science on society. And it is not yet clear that the lengthening of the life span, particularly the effective life span, is an undesirable "impact." In brief, the alleged conflict between science and society is based largely on misunderstanding and on unwarranted generalizations.

SERVICES OF SCIENCE

The services of science to society are increased knowledge and understanding. That such increased knowledge, understanding and control of the forces of nature are used, not by scientists, but by society, with increasing effectiveness in the continuous and recurrent drives to satisfy greed, lust, hate and vanity, will, in my judgment, ultimately prove to be due, not to the inherent nature of the scientific method or of knowledge per se, but to the failure of man, so far to be effectively conditioned by science and the scientific method.

It is sometimes asserted that science is amoral if not immoral. The latter may be true, if it is immoral to challenge and destroy taboos and traditions based on ignorance and misunderstanding. But to call the impartial, industrious and earnest search for new knowledge amoral or immoral conflicts with my conception of immorality. As I understand it, there is no conflict between the scientific method and our sense of justice, though I admit that the latter stems from a much broader base than science. Individual scientists may at times, in their ivory towers, express distrust of society or the common man, as disclosed by the following recent statement from an eminent surgeon: "Whether the public interest (in medical research) is something deeper than curiosity, and whether it can be relied on as a potent factor for the common good have not been demonstrated. Indeed, a study of the historical background of surgery invokes in the mind of the medical scientist a distrust of the public." The doctor cites among other examples the Edict of Tours (1165) declaring surgery not respectable. But that edict was not the work of the common man. It was a product of the leaders of the church.

On the other hand, the defeatists among us, noting the conspicuous though superficial role of science in modern thought and modern life, occasionally see in science and the scientific method the very root of some of our modern ills. Thus the leaders of a little college on our Atlantic seaboard have boldly undertaken to rectify the alleged conspicuous educational failure of Harvard University by providing "conditions for liberalizing and humanizing science." And this the college hopes to achieve by the "strategy of taking specialists in the sciences and re-educating them in the liberal arts." We are not told what to do for or do with the people who were educated in the liberal arts before they became specialists in science. Maybe these unfortunates are acephalic satraps of Satan or just dead and do not know it. A pessimistic colleague in the social sciences recently referred to our times as one of "intellectual confusion of men. It has become so common to justify the bad and belittle the good, that the words good and bad, honor and dishonor, truth and falsehood have lost most of their meaning for persons who influence public opinion." Even if this paean of pessimism is entirely true, what evidence have we that it was better instead of worse yesterday, a hundred, a thousand, a hundred thousand years ago, when science and the scientific method were unknown? Few if any real scientists will take exception to the humanist who insists that "under the shelter of the word culture there must be room for a more dynamic ingredient added by the person who can produce fine things." I think among the "persons who can produce fine things" are the men of science, and among "the fine things" are new facts about men in health and in disease, new facts about the universe, new facts about the nature of life and matter, new understanding and new powers of control of the forces of nature.

Many world events in recent years have made some assert that worthwhile human society can not persist or prevail without the perennial supremacy of deceit and greed, violence and war. Others question whether these very antitheses of the scientific method can persist side by side with science and the necessary human qualities that go with the method of science. Deceit, violence and war have certainly been with us before the dawn of history as a part of the "struggle for existence" while science and the scientific method are of a much more recent vintage. It is also true that the "struggle for existence" in smaller groups such as the family, the tribe, and the nation ultimately curbed, at least in part, both deceit and greed, violence and war. Can such curbing be achieved on a larger scale or is it desirable that such curbing of man's past drives be achieved in the interest of the future welfare and progress of man? So far as I can see there is only one answer to this question, and that answer is given both by history and by the primary interest of society. Herbert Spenser said: "Whatever fosters militarism makes for barbarism; whatever fosters peace makes for civilization." To refer again to the resolution of the American Association for the Advancement of Science: "Science can flourish only where there is peace and intellectual freedom." Are intellectual freedom and peace the desiderata for man? If this is so, there is no fundamental conflict between science and society, as I view society of the future. But some of us are inclined to take the more virile position of the immortal Pasteur who said: "Science and peace will triumph over ignorance and war." But to-day the "blackouts" imposed by our modern barbarism seem particularly monstrous, partly because of the current bright light of scientific understanding. The endemic and cyclical psychosis of our race is nothing new. There were shackles, even more deadly, on the human mind in other ages. There were burning libraries and

rivers of human blood in other days and climes. But through the past and present immense and ugly wilderness of man's inhumanity to man there runs a trail, at times scarcely discernible, but still a trail, blazed by the search for understanding, occasional kindness and the groping for justice.

FAILURE OF SCIENCE TO MODIFY HUMAN CONDUCT

The evident failure of modern science to measurably influence human drives and conduct, individually, nationally, internationally, are probably to be sought in three factors: (1) the character of our prevailing education. Our prevailing education, starting in the home and in the church, in the grade school and the high school, and extending into the college, is too much education by dictation. It is indoctrination rather than education by understanding the why and wherefore through experimentation and controlled observation. This applies to countries other than our own. There are those in our own country who insist all along the line on education by more and more dictation and indoctrination. Merely the memory of and the ability to repeat a heterogeneous number of facts, or even coordinated facts discovered and interpreted by science, is not education in the method of science. We can teach a parrot to talk Latin and repeat a syllogism, but that Latin-speaking bird is still a parrot. In the bulletin of the Association of American Colleges for December, 1935, there is an article entitled, "The Alumni Go to College." In this article are brief accounts of faculty offerings to the alumni of their respective schools. Science is not even a "second best," an "also ran." But Princeton offered its alumni "Modern Problems in Sea Power." Wooster University offered "Suggestions for Travel in England." Mount Holyoke reported on "We Americans of To-day" and "The Church in the Nazi State." At Rollins they took "An Excursion into the Field of Biology," which might mean anything, and in 1933 Lawrence College had something on "The Subterranean World," which may have been either geology or politics. The University of Akron listed as important food for alumni thought: "The New Deal and Foreign Trade." Barnard College evidently considered it most important for its alumnae to learn "How to See a Play," and also to learn something about "The Modern Dance Movements," and in 1935 Lawrence College presented its alumni "Gothic Architecture" and "The Artistic Prospect of the Cinema in America." Evidently these topics interest and entertain our alumni. They remind us of a recent paper on education, entitled, "Learning and Lollipops." But do we have to follow Hollywood? Are we sure that our alumni can not digest stronger meat? If they can not, there is little of worthwhile significance in our A.B. and B.S. degrees. It is interesting to travel in England; but to us it is more important to live the full life in America. The latter demands something more than "Modern Dance Movements" and "Artistic Prospect of the Cinema." It demands the latest news on heredity, on the electron and the proton, on bacteria and health, on soil conservation, chemistry and cancer; on birth control and pest control; on better foods, better homes, better children; and on a thousand other problems of life on which science has provided understanding and working out our control. The number one problem facing man today and tomorrow is overpopulation and starvation. Two thirds of the people in our world are poorly nourished. Almost half of mankind—a billion people—are actually starving. Despite this tragic situation the world population is increasing by about 75,000 per day, that is, we have that many births above our deaths. If we breed like rabbits in the long run we have to live and die like rabbits. On the little island of Japan, a territory about the size of the state of California, there are now 84 million people. That many people on that small part of the earth cannot now be adequately fed.

(2) Considerable responsibility for the failure of science to essentially modify human conduct must be laid to the scientists themselves. Many of us are scientists only during our working hours, and fall into the common errors of the average man when we step outside our own specific field. Many of us have considerable fog in our brains and clay in our feet, and this is discerned by leaders in other human endeavors and by the man in the street. Scientists frequently become dogmatic both inside and outside of their own fields. A few years ago a British biologist of some standing published a little book ("Heredity and the Ascent of Man") in which he tells us that: "Perhaps the most serious obstacle in the way of any permanent intellectual improvement in the human race is the democratic nature of governments which make the laws and rule the affairs of the more civilized states. . . . Recent events in Italy and Germany, where democracy has been replaced by dictatorship show the practical possibilities of state action for race improvement." As if anything could possibly be proved in the way of elevating German and Italian character and intellect in the short period that these dictators have held sway. For the progress of science the very antithesis of dictation and regimentation seems the most favorable environment. But it appears that even the most thorough conditioning in the natural sciences does not always carry over into the problems of social, economic and political relations. A few years ago an American zoologist wrote a book with the title "Out of the Night," a queer book from the pen of a man of science, in which he tells us that: "In the capitalistic state the search for truth will eventually languish of its own internal debility." The title of this book is "Out of the Night." It should have been "Into the Fog." For is it not fact that the individual search for truth is an internal drive, to be sure, influenced by the political, social and economic environments, but, at least in part, independent of them? The dawn of science antedates capitalism. Science has been fostered, at least by individual capitalists, and the record of dictators in the matter of fostering the scientific way of life is, to say the least, as varied and uncertain as that of capitalist. There is an embryonic dictator beneath the skull cap of every man. And the fury against individual freedom, science and honest inquiry is not confined to any race, creed, cline, economic or political order. An obvious deduction from the method of science is this: "Keep your mouth shut and your pen dry until you know the facts." Unfortunately, even scientists at times fail to follow this basic code.

(3) The third factor is the tremendous resistance of man to new ways of thinking and new ways of life. During the past million years that man has evolved under the influence of the non-scientific or raw environment, he has developed emotions and habits and drives that are not easily, speedily or permanently modified by the environments and techniques developed by man himself through science. There is no use crying over this situation. It is one of the recognized scientific facts, and we must accordingly work toward the goal with longer vision and greater tolerance and patience. Science as an educational and social force is but of yesterday. Man has been exposed for ages to the fundamental ethics of the great religions, using the elements of fear, punishment and perpetual reward as motives, something that science can not do. And yet the effects of this exposure seem neither significant nor lasting.

COMMENT

From all the evidence now available it seems clear that in the past greed, guile and violence had survival value for primitive man. Assuming that these drives can be curbed on a national or international scale by new mores based on understanding, reason and emerging justice, will the latter have equal survival value in and for the kind of society we hope to build? My answer is yes, with this proviso: I think we must apply new and different measures to reduce the number of the least fit in the human race. We have enough information to make a beginning in that direction now, but prevalent mores prevent it. Unless reason based on understanding effectively guides social evolution of to-morrow in the direction of elimination or reduction in number of the least fit, those who can not or will not strive for the individual and the common good, I see no escape from the degeneration that invariably follows biologic parasitism, except the ancient law of tooth and claw.

As I see it, ours is not an age of science. Men are still driven by greed and confused by guile, rather than guided by reason based on our expanding knowledge. Science has greatly enlarged man's understanding, conquered many of his diseases, lengthened his life, multiplied his joys, decreased his fears, and added much to his physical comforts and powers. But man may and does use these and other achievements for a greater social injury, instead of for a further social advance. Science is specifically human, in that it stems from the innate curiosity of all men, and the conspicuously plastic brains of the ablest, if not the noblest, of our fellows. If this be so, it follows that the scientific method and

its products can not be, in any fundamental and permanent sense, in conflict with human nature, though our present human society, a product of the past, dominated by greed, force and fear, may be and is in conflict with the scientific method. Whether science and the scientific method, whether understanding, honesty, reason and justice can contrive survival values equal, if not superior to the blind forces of nature which shaped man's past, is as yet in the laps of the gods. Still, we can not deny the possibility, and we will nurse the hope that the hairy ape who somehow lost his tail, grew a brain worth having, built speech and song out of a hiss and a roar, and stepped out of the cave to explore and master the universe, may some day conquer his own irrational and myopic behavior towards his kin.

I think we can say, even in the face of current pessimism, that during the ups and downs of a million years man has gradually acquired more understanding, more freedom from fear, more dignity, greater kindness and a clearer conception of justice. Even though for the moment, "the bird of sorrow" is not only flying over our heads, but is actually nesting in our hair—to borrow a Chinese proverb—that bird will not nest in our hair forever, even though a blackout on the light of science is decreed in every land. For, slowly but surely, the method of science will help to make life more intelligent, toil more cheerful, fear and hatred, pain and tears less prevalent in our lives. If in any place or time the blind fury of hatred of our brethren and the insane violence of war render the pursuit of science impossible, and the scientific method submerged and forgotten, it will be rediscovered, in better days, by better men.

Dr. E. D. Adrian, president of Britain's Royal Society, master of Trinity College, Cambridge, and Nobelist in medicine and physiology in 1932 said: (Science News Letter, Sept. 11, 1954) "The scientist, therefore, has a double responsibility. He must apply his science to learn as much as possible about the mental and physical causes which makes us behave as we do, he must study human nature to prevent its failures. But he cannot wait for the discoveries which might make us act more wisely: he must take us as we are and make it his task to point out that the human race canot stand more than a few thousand large atomic explosions whether they hit their target or miss it. If we must continue to make war, there is no kind of scientific investigation which might not be used to make it more destructive.

"There can be no guarantee that discoveries in the field of human conduct would be harmless. A drug or a system of education which would make us all do as we are told, a method of producing radical conversion to a new system of belief, a knowledge of new ways of rousing patriotic ardour, all these might be used with consequences almost as grim as the genetical deterioration in a radioactive world.

"We are no doubt born with brains like those of our remote ancestors and when we are grown up, we have no more native intelligence than they had, but our brains must have been so modified by what we have learned that they are physically and chemically different, better adapted for complex social life of our time."

"We have more knowledge at our disposal. If all goes well with out training the brains we have, we ought to be more civilized than those of our fathers and those of the next generation more civilized than ours."

When Bernard Baruch was asked if there is any defense against atomic bombs, he is reported to have answered: "Yes, Peace."

When the Princeton University biologist Edwin Grant Conklin retired as President of the American Association for the Advancement of Science, he put one phase of the problem I have been discussing in this form: "Will science, which has so largely made our modern civilization, end in destroying it? Has it not placed power in the hands of ignorant and selfish men which may wreck the whole progress of the race?" I am not that pessimistic. I rather join George Washington, the "father of our country," who said, in his first inaugural address: "Every lover of his country and of mankind should be encouraged to support the advances of science." If we follow George Washington's advice we will develop more intelligence and therefore less violence.

MEDICAL FILM REVIEWS

Within Man's Power: 16 mm., black and white, sound, showing time 29 minutes. Produced in 1954 by Nicholas Webster Productions, Washington, D. C., for the National Tuberculosis Association. Procurable on loan or purchase from state or local tuberculosis associations.

This film was produced to commemorate the 50th anniversary of the National Tuberculosis Association. It portrays the average family physician and a family confronted with a newly diagnosed case of tuberculosis. The family goes through the typical reaction of anxiety as to the final outcome of the disease. The family physician explains the nature of the disease and the progress of tuberculosis beginning with the time the organism causing the disease was discovered by Robert Koch in Germany in 1882. He explains the various beliefs and treatments that were given at that time, such as bloodletting, inhalation of compressed air, closed windows, no drafts, no night air, and the universal opinion that heredity was the chief factor of the disease. The physician then goes on to tell of the early attempts of Dr. Lawrence Flick of Philadelphia, in 1889, to have the disease reported by family physicians to the board of health. He also tells of the early formation of the Pennsylvania Society for the Prevention of Tuberculosis, which finally formed the parent organization of the National Tuberculosis Association, and of its first president, Dr. Edward L. Trudeau. The physician relates the difficulties of early educators and brings in the various attempts of quacks to take over and capitalize on the victims of the disease. He also tells of the introduction of the first Christmas seals in Philadelphia in 1907, which now have become an annual Christmas tradition to raise funds for the education, rehabilitation, case finding, and research programs of the voluntary agencies working in cooperation with official agencies. The physician's education of the members of the family makes them feel that having consumption in the mid-20th century is a far cry from the early days in the recognition of the disease. Modern medical science, with its drugs, surgery, sanatoriums, and other facilities, makes hope for life and complete rehabilitation more certain. The film is an excellent educational medium in showing the battles of pioneers to gain recognition and support for their advanced knowledge. It is a film that should be seen by all who are interested in tuberculosis control.

NEW FILM ADDED TO A. M. A. MOTION PICTURE LIBRARY

The Valiant Heart: 16 mm., black and white, sound, showing time 27 minutes. Sponsored by E. R. Squibb & Sons. Produced in 1954 by MPO Productions, Inc., New York, for the American Heart Association. Procurable on loan (service charge $2) from the Committee on Medical Motion Pictures, 535 N. Dearborn St., Chicago 10.

This case history of 8-year-old Lee Sawyer is designed to give a general adult audience, especially parents and teachers, the facts about rheumatic fever. It is a documentary-type film in which the case, selected from the residents of a small community, makes clear that this real-life situation might arise in any family or in any community. The manner in which the doctor, public health nurse, teacher, and neighbors rally to help the Sawyer family demonstrates that rheumatic fever is a bigger problem than any one person or family can handle. A printed discussion guide accompanies the film. The relationships in family living shown in this film are very good; the boy's disease is merely an incident in the family situation. There are also excellent relationships between the doctor and the family, the doctor and the patient, and the cardiologist and the general practitioner. This is an excellent film that can be recommended to all lay groups. Medical students and house staff officers would also be interested in seeing the film, not only because it shows methods of treating a child at home but also because it shows the cooperation of outside agencies such as the public health nurses.

MEDICAL LITERATURE ABSTRACTS

INTERNAL MEDICINE

Effects of Flying on Patients with Cardiovascular Disease. G. Bourne. Brit. M. J. 1:310-313 (Feb. 5) 1955 [London, England].

Thirty persons with organic cardiovascular disease were able to undertake trips by air successfully. Most of the common varieties of severe organic heart disease were represented in this group. In all cases the state of cardiac compensation was good at the time of flying, and in no patient did such air travel deleteriously affect the heart or the hypertension, either at the time or subsequently. Adequate pressurization of the aircraft must be assured in such cases. Under these conditions, it would seem that flying is perfectly safe when the heart is well compensated and is a reasonable risk in patients whose state of compensation is not perfect, provided that the journey is necessary or important enough to the patient for him to run a moderate risk. Generalizations as to the suitability or unsuitability for flying cannot be made; each case must be considered on its own merits. The benefit of the short air journey must be set against the disadvantage of the longer sea transit in those patients who may need to be in close contact with specialized medical care. Figures from a recent survey carried out by the Medical Committee of the International Air Transport Association, which includes 13 different air lines, show that on a five-year average one cardiac death has occurred per 1,113,000 passengers carried, and that one cardiac death has occurred per 800 million passenger miles.

Can Ward Rounds Be a Danger to Patients with Myocardial Infarction? K. A. J. Jarvinen. Brit. M. J. 1:318-320 (Feb. 5) 1955 [London, England].

Six out of 39 hospitalized patients with acute myocardial infarction who died more than seven days but less than six weeks after the onset of infarction had their fatal attacks during or shortly after ward rounds. This number was greater than that which could be accounted for by chance. Four of the ward rounds in connection with which the deaths occurred involved an unusually heavy mental stress to the patients concerned. In two cases discharge from hospital, eagerly awaited by the patient, was to be decided on at that very occasion. In another two cases the round was that of the physician-in-chief, made only once or twice a week. The conclusion is that the ward round may sometimes constitute such a heavy strain on the patient that in cases in which this strain may be deleterious, as in myocardial infarction, it may constitute a danger. Three methods of reducing this hazard are suggested. 1. The attending physician must be aware of the risk and must be careful to exhibit a sympathetic attitude at all times. 2. Neither the physician nor, particularly, the nursing staff should emphasize the importance of ward rounds to the patient. The bustle of preparation preceding the visit should be reduced to a minimum. 3. The administration of sedatives to any patient with myocardial infarction who shows signs of excitement is extremely important, though it does not constitute as definitive a treatment as the removal of the cause of apprehension.

The place of publication of the periodicals appears in brackets preceding each abstract.

Periodicals on file in the Library of the American Medical Association may be borrowed by members of the Association or its student organization and by individuals in continental United States or Canada who subscribe to its scientific periodicals. Requests for periodicals should be addressed "Library, American Medical Association." Periodical files cover 1946 to date only, and no photoduplication services are available. No charge is made to members, but the fee for others is 15 cents in stamps for each item. Only three periodicals may be borrowed at one time, and they must not be kept longer than five days. Periodicals published by the American Medical Association are not available for lending but can be supplied on purchase order. Reprints as a rule are the property of authors, and can be obtained for permanent possession only from them.

The Liver in Congestive Heart Failure. T. J. White, C. M. Leevy, A. M. Brusca and A. M. Gnassi. Am. Heart J. 49:250-257 (Feb.) 1955 [St. Louis].

This report is based on histological studies of the liver correlated with clinical and biochemical findings in 75 patients with congestive heart failure. The patients were taken from routine hospital admissions. Each patient was on a regimen that included bed rest, sodium restriction, diuretics, and digitalis. Eighteen patients had relief of all clinical evidence of heart failure after treatment, 20 patients showed hepatomegaly despite disappearance of other evidence of congestive failure, and 37 patients had persistent fluid retention. Seventy-one patients had hepatomegaly, 37 had ascites, 16 had jaundice, 9 had splenomegaly, and 8 had hepatic pain. Serial biopsy studies demonstrated two mechanisms leading to liver fibrosis in heart failure: (1) passive congestion led to central necrosis and centrilobular fibrosis; (2) poor nutrition caused fatty liver and eventually diffuse fibrosis. Survival periods were related to the severity of hepatic changes in patients with fibrosis or necrosis and to the type of heart disease and the degree of heart failure in the others. Icterus, hypoalbuminemia, and diffuse fibrosis were often accompanied by fluid retention refractory to therapy. The prognosis in these cases was poor. A study of the liver in congestive heart failure improves prognostic and therapeutic perspective. Use of a composite approach including clinical, biochemical, and histological study is desirable in patients with hepatomegaly or fluid accumulation resistant to treatment. The hepatic lesion is as important as the cardiac dysfunction in patients with diffuse fibrosis of the liver.

Comparison of the Efficacy of Tetracycline and Penicillin in the Treatment of Pneumococcal Pneumonia. E. Frei III, C. R. Auner, T. E. Van Metre Jr. and C. G. Zubrod. New England J. Med. 252:173-176 (Feb. 3) 1955 [Boston].

Frei and associates compare the efficacy of tetracycline and penicillin in the treatment of pneumococcic pneumonia, pointing out that tetracycline is similar to its analogues chlortetracycline and oxytetracycline, the only difference being that chlortetracycline has an additional chloride radical and oxytetracycline an additional hydroxyl radical. The comparison was made on 57 patients admitted with pneumococcic pneumonia to a St. Louis hospital. The patients were divided into two comparable groups, one receiving tetracycline by mouth and the other penicillin by intermittent intramuscular injection. All patients whose history number ended in an odd integer received tetracycline, and all whose history number ended in an even integer received penicillin. The dosage of tetracycline was 1 gm. on admission and 1 gm. every six hours thereafter. Crystalline potassium penicillin G in aqueous solution was given in dosages of 300,000 units at the time of admission and every 12 hours thereafter. Both treatment schedules were continued until the temperature by rectum was 100 F or below for at least 48 hours. No differences in the therapeutic responses to the two drugs could be demonstrated. However, though tetracycline at this dosage level proved as effective as penicillin, its use was associated with unfavorable side-reactions. The most common untoward symptom complex was nausea, vomiting, and diarrhea associated with a predominant growth of Micrococcus (Staphylococcus) aureus in the stool culture in 4 of the 26 patients receiving tetracycline. There is ample evidence that such a diarrhea is a common distressing and sometimes fatal complication of therapy with other analogues of tetracycline. There is some indication that diarrhea is less common with tetracycline than with chlortetracycline therapy, but a comparative study is still needed to make this evidence conclusive.

Pleural Effusion: Statistical Study of 436 Patients. E. C. Leuallen and D. T. Carr. New England J. Med. **252:**79-83 (Jan. 20) 1955 [Boston].

A review of 436 cases of pleural effusion revealed that a malignant neoplasm was responsible for the effusion in about half the cases. Congestive heart failure and infections each caused about 10%. Miscellaneous conditions accounted for about 12%, and the cause could not be determined in the remainder. Carcinoma of the bronchus was the commonest neoplasm in the group, accounting for almost half the neoplastic group. Carcinomas of the breast accounted for almost a fourth and lymphomas for about an eighth. The detection of malignant cells in the pleural fluid was of great help in establishing a diagnosis. Such cells were detected in more than half the fluids due to carcinoma of the bronchus or the breast. In contrast, only an eighth of the fluids caused by lymphoma were found to contain malignant cells. The presence of blood in the fluid did not affect the frequency with which malignant cells were detected. Two or more specimens of fluid were examined for malignant cells in 41 cases in which the presence of a malignant neoplasm was proved. In half these cases one specimen was found to contain malignant cells, but such cells could not be detected in another specimen from the same patient. Therefore, repeated examinations should be made when the diagnosis cannot be proved by simpler methods. Tuberculous pleurisy with effusion was proved in 16 cases by the isolation of the tubercle bacillus from the fluid. In 15 of these both cultures for acid-fast bacilli and guinea-pig inoculations were positive. In one case the guinea-pig inoculation was positive, but the culture for acid-fast bacilli was negative. This slight superiority of guinea-pig inoculation hardly justifies the routine use of this test in the study of pleural fluid. The quantity of protein in the fluid seemed to be of more value than the specific gravity of the fluid in separating transudates from exudates. Total leukocyte and differential counts were of no value in indicating the cause of the pleural effusions.

Comparative Value of the Basal Metabolic Rate, Chemical Protein-Bound Iodine, and Radioactive Iodine Excretion or Uptake in the Diagnosis of Borderline Hyperthyroidism When Used Individually or in Combination. L. Zieve, B. Skanse and A. L. Schultz. J. Lab. & Clin. Med. **45:**281-285 (Feb.) 1955 [St. Louis].

A comparison was made of the relative value of the determination of the basal metabolic rate, chemical protein-bound iodine, and radioactive iodine excretion in 24 hours for purposes of distinguishing between borderline euthyroid and borderline hyperthyroid patients. Individually considered, the radioiodine excretion test was most effective. The protein-bound iodine test was approximately four-fifths as effective and the basal metabolic rate determination one-fifth as effective. A weighted combination of the tests was slightly more effective than the radioiodine excretion test. The basal metabolic rate contributed little to this combination. Eighty-nine per cent of its observed effectiveness was due to factors it has in common with the other tests. The protein-bound iodine and radioiodine tests are also mutually interdependent. Forty-six per cent of the observed effectiveness of the protein-bound iodine determination was contributed by factors held in common with the radioiodine test. Similarly, 29% of the observed effectiveness of the radioiodine test was contributed by factors held in common with the protein-bound iodine determination. The number of patients tested was 84, 42 being euthyroid and 42 hyperthyroid. These patients were very closely apposed along the scale from euthyroidism to hyperthyroidism, thus enhancing the validity of the test.

Asthma: Diagnosis and Treatment. M. Comeau. Union méd. Canada **84:**164-167 (Feb.) 1955 [Montreal, Canada].

The aim of treatment of asthma at the Institut Lavoisier in Montreal is to stifle attacks rapidly and then keep patients asymptomatic through progressive desensitization. The respiratory function of each patient is calculated before and after treatment as a means of judging its efficacy. Before the start of treatment, allergy tests are carried out and the sputum is tested for bacteria. Moderate attacks of asthma are treated by ordinary methods—bronchodilatation, aminophylline, antihistamines, etc.—while the administration of corticotropin is reserved for status asthmaticus. The hormone is administered by intravenous infusion; about 20 units in 500 cc. of glucose solution are given over a period of 8 hours. In the severest cases, 20 units of retarded-action corticotropin given intramuscularly are added. The patients are maintained on a low-sodium, low-protein diet, and potassium is given in the form of iodide or chloride. As soon as the lungs are clear of sibilants and ronchi, which usually takes from two to five days, the intravenous therapy is stopped and the intramuscular therapy of 20 units a day is continued or begun, as the case may be, and is progressively diminished to 10 units every other day. Antibiotics are used to combat concomitant infections. Epinephrine is rarely used at any point in the treatment. Desensitization often begins before the patient is discharged from hospital. The follow-up of some patients has been two years or more, and their treatment has proved on the whole excellent. The principal cause of failure of treatment is the patient's unwillingness to keep up the desensitizing injections; he is already asymptomatic and therefore has a false sense of security.

Interrelationship of Folic Acid, Vitamin B_{12} and Ascorbic Acid in Patients with Megaloblastic Anemia. J. F. Mueller and J. J. Will. Am. J. Clin. Nutrition **3:**30-44 (Jan.-Feb.) 1955 [New York].

This is one of a series of reports on the nutritional aspects of blood formation. Mueller and Will discuss some of the clinical experiments their laboratory performed over the past eight years in an attempt to test various aspects of the interrelationships of folic acid, vitamin B_{12}, and ascorbic acid. After testing four different propositions they find that folic acid and vitamin B_{12} deficiency states are associated with defects in nucleoprotein metabolism characterized biochemically by increased ratios of ribose nucleic acid to desoxyribose nucleic acid and uracil to thymine. These biochemical changes can be correlated with the degree of megaloblastosis. In pernicious anemia, folic acid therapy will temporarily correct the defect in nucleoprotein metabolism by mass action. Eventually, a greater deficiency of vitamin B_{12} occurs, resulting in hematological relapse and progressive neurological disease. Folic acid is inactive at the erythroid cellular level, while vitamin B_{12} is active at the erythroid cellular level. Pernicious anemia of pregnancy and vitamin B_{12}-refractory megaloblastic anemia also occur because of defects in nucleoprotein metabolism. These abnormalities arise because of conditioned deficiencies of folinic acid coenzyme rather than a deficiency of vitamin B_{12}. Ascorbic acid metabolism may be altered in patients with megaloblastic anemias. The plasma ascorbic acid level is subnormal as compared with that in a group of patients with similar dietary background but without macrocytic anemia. Vitamin C is capable of producing reticulocytosis and improvement in the anemia of some of these patients. The alteration in ascorbic acid metabolism may reflect changes in redox potentials associated with vitamin B_{12} deficiency.

Heredity in Diseases of the Blood. A Grasset. Presse méd. **63:** 50-53 (Jan. 12) 1955 (In French) [Paris, France].

The hereditary factors in hereditary anomalies of the red blood cells, hereditary anomalies of the white blood cells, genotypic hemorrhagic diseases, and in the leukoses and pernicious (Biermer's) anemia are reviewed. Diseases of the red blood cells take two different forms, one heterozygous and the other homozygous; the latter form is the more serious. Pelger's nuclear anomaly has the same peculiarity. That hemophilia can occur in females is now established; it is, however, extremely rare, since it may occur only from the union of a hemophiliac and a female carrier. The term "hemophilia" is actually applied to two different diseases that follow the same hereditary laws but are due to the absence of two different plasmatic factors of coagulation. With the improvement in methods of study of hemostasis and coagulation, the platelet diseases and the vascular diseases were dissociated; besides, thrombopenia is not hereditary but originates from an antigen-antibody conflict (antiplatelet antibodies). The mode of transmission of other

thrombopathies is being studied, as is that of the various vascular diseases; only in hemangiomatosis (Rendu-Osler-Weber disease) is the role of heredity well defined. No evidence of hereditary factors in leukosis has been shown, but a particular hereditary background has been proved to be necessary for the development of pernicious anemia. The same background is essential to botryocephalic anemia and even to achylous hypochromic anemia. In many of the blood diseases, the laws of heredity are simple, not differing from the classic pattern of dominant-recessive except for a tendency toward greater phenotypic incidence of a dominant trait in the homozygous state and light, latent phenotypic manifestations of a recessive trait in the heterozygous state. In certain diseases, a familial character has been established, but the rules governing transmission of the disease are difficult to discover. In a third category of diseases, the hereditary nature itself can be disputed. Further studies in hematological genetics will probably show that in human genetics, as in experimental genetics, some hereditary mechanisms are extremely complex and there are intervening factors, for instance polyallelic phenomena. Some phenotypic manifestations require for their appearance a particular series of genes in the genotype. As as example of this, it is pointed out that a special form of sickle-cell disease may occur in a child whose parents are carriers, one of sickle-cell disease and the other of hereditary leptocytosis (Cooley's anemia).

Parahemophilia. C. A. Owen Jr. and T. Cooper. A. M. A. Arch. Int. Med. **95**:194-201 (Feb.) 1955 [Chicago].

According to Owen and Cooper the term parahemophilia was coined by Owren about 10 years ago to designate a bleeding diathesis attributable to the lack of a single blood-clotting factor, namely, factor V, or labile factor. Only 45 definite cases, involving 13 families, have been reported so far. This report is concerned chiefly with a man who had clinical and laboratory manifestations of this defect. Studies were made also on his three children, who presented laboratory evidence of a deficiency of the labile factor but no clinical suggestion of a bleeding tendency. In agreement with published reports, both sexes in this family were involved and the inheritance was direct from one generation to the next, perhaps as the result of an incompletely dominant gene. Studies of 10 other relatives revealed no further instances of the disease. This patient, just like Owren's, was found to have a normal concentration of prothrombin. However, the speed with which thrombin could form from the available plasma prothrombin was retarded to 8% of the normal rate. Retarded conversion of prothrombin, which is a characteristic of deficiency in labile factor, is no longer enough to justify the diagnosis of parahemophilia, for another clotting factor has been found to have the same property. Shortly after the reports of Owren, several publications appeared from the Mayo Clinic indicating that a second factor existed and that it was also important in the early phases of coagulation; this was a stable factor with cothromboplastic activity. It is apparent that patients previously described as having "idiopathic hypoprothrombinemia" may well have lacked the labile factor, the stable factor, or both factors. Evidence that the deficiency in the patient presented here was of the labile rather than the stable factor is presented in a table. The differential diagnosis of parahemophilia is basically the distinction between a lengthened "prothrombin time" caused by lack of labile factor and prolonged "prothrombin times" from other causes. Treatment for the bleeding of parahemophilia consists of transfusions of fresh blood or plasma that, because of its freshness, is rich in labile factor.

Idiopathic Hyperlipemia and Primary Hypercholesteremic Xanthomatosis: IV. Effects of Prolonged Administration of Heparin on Serum Lipids in Indiopathic Hyperlipemia. W. F. Lever, F. S. M. Herbst and N. A. Hurley. A. M. A. Arch. Dermat. **71**:150-157 (Feb.) 1955 [Chicago].

Five patients with idiopathic hyperlipemia received injections of heparin for periods varying from two weeks to eight months. In all five patients a considerable decrease in the turbidity and in the lipid values of the serum was attained. While in two patients with less severe hyperlipemia the lipid values in the serum decreased to nearly normal, there was a partial decrease only in the two patients with severe hyperlipemia. Daily intravenous infusions of heparin for 16 hours a day caused a more rapid decrease in the lipid values than did daily intramuscular injections of repository heparin. Daily intramuscular injections of heparin in aqueous solution were least effective. No untoward reactions to the heparin occurred. Cutaneous xanthomas disappeared or decreased in size in three patients who had such lesions and received heparin for a prolonged period of time. Because patients with idiopathic hyperlipemia show a predisposition to atherosclerosis, treatment is indicated. If a strict low-fat diet fails to bring about adequate reduction of the serum lipid values, the use of heparin in addition to a low-fat diet may be indicated.

Bases and Possibilities of Treatment of Sudeck's Atrophy and Peripheral Disturbances of Circulation with Ganglion Blocking Substances. J. Götze. München. med. Wchnschr. **97**:49-51 (Jan. 14) 1955 (In German) [Munich, Germany].

In recognition of the part played by the autonomic nervous system in the pathogenesis and in the course of osteoporosis due to trauma (Sudeck's atrophy), Götze used Ratschow's method of inducing continued therapeutic sleep (so-called artificial hibernation) by parenteral administration of a proprietary preparation of N-dimethylaminopropyl phenothiazine (Phenergan) called Atosil combined with Megaphen, another proprietary phenothiazine derivative of even greater potency [J. A. M. A. **154**:178 (Jan. 9) 1954]; Götze combined it with the daily intramuscular administration of 1 ampul of a repository preparation of pancreas extract (Padutin) and 1 ampul of a vitamin E preparation of high potency in patients with recent cases of osteoporosis due to trauma. Phenergan and Megaphen have a central and peripheral action on the autonomic nervous system; checking of the transmitter substance at the synapses probably is the mechanism of their action. The entire metabolism of the organism is reduced simultaneously. After 72 hours of therapeutic sleep, continuous oral treatment was instituted with 1 tablet of 25 mg. of Megaphen, and in addition 1 tablet of Padutin and 1 tablet of 100 mg. of vitamin E, each of these given three times daily for three to four weeks. After 8 to 10 days of treatment the patients were allowed to be out of bed except for one to two hours of bed rest after the administration of Megaphen because of the risk of an orthostatic collapse. Coffee, tea, alcohol, and caffeine-containing drugs should not be taken. One to 2 additional tablets of Phenergan may be given daily if freedom from pain cannot be obtained with Magaphen alone. After four weeks of treatment in the hospital the patients were discharged and ambulatory treatment was continued at home, using the smallest dose of the phenothiazine derivatives with which the desired effect could be obtained. Drug treatment was combined with intensive physical therapy, including bathing of the healthy side; connective tissue massage of the region of the shoulder and the nape of the neck; and active exercises in warm water. The same method of treatment also was used in patients with disturbances of peripheral arterial circulation; therapeutic sleep was induced in the acute stage (attack of pain), while in patients with chronic disturbances continued oral treatment was given from the start. A six to eight weeks' course of Megaphen therapy was carried out and after an interval of four weeks, the course was repeated. Results were highly satisfactory. Patients with osteoporosis due to trauma experienced an alteration of the autonomic nervous system with complete or considerable freedom from pain, improved function associated with rapid disappearance of the clinical symptoms, and roentgenologic confirmation of accelerated repair of bone. Disappearance of tendency to edema, improved capillary circulation, and better general condition were notable. Thus an early start of an intensive active motion therapy was facilitated, and this contributed essentially to the prevention of stiffening and contracture. Freedom from pain and alteration of the autonomic nervous system also was obtained in the patients with disturbances of arterial peripheral circulation; Megaphen therapy in these patients is indicated at the onset of the disease and as preoperative and postoperative treatment in those with advanced disease in whom surgical treatment is indispensable.

Initial Control of Hypertension with Pentolinium Tartrate. D. W. Ashby, J. O'Neill and M. C. Maclean. Lancet **1**:224-228 (Jan. 29) 1955 [London, England].

In the group of hospitals with which Ashby and associates are connected, methonium salts have been used from the autumn of 1950. To assess their effect more completely, a clinic for hypertensive patients was started in the summer of 1951. From October, 1953, pentolinium tartrate (Ansolysen) was used, and subsequently most of the new patients with hypertension were treated with this drug in preference to all others. Up to now 72 hypertensive patients have been admitted to hospital for treatment with pentolinium tartrate. The authors differentiate three groups of hypertensive patients: (1) those with labile hypertension, who have a diastolic pressure below 120 mm. Hg and no complications and who require only sedation and reassurance; (2) patients with persistent hypertension (diastolic pressure 120 mm. Hg or higher) and established complications; (3) patients with malignant and premalignant hypertension. Most of the patients treated with pentolinium tartrate were in groups 2 and 3. They had persistently high diastolic blood pressure or persistent symptoms, usually headache, breathlessness, dizziness, and failing vision. Nevertheless, if severe symptoms were present, patients with diastolic pressure as low as 100 mm. Hg were treated. The authors developed a method of initial stabilization of patients on pentolinium tartrate in their clinic for hypertensive patients. The method requires that patients shall be up during the greater part of the hospital day and be exercised before blood pressure estimations, which are taken every two hours with the patient sitting erect. The initiation in general practice of hypotensive treatment with pentolinium tartrate is inadvisable because of the liability to occasional severe reactions that need prompt countermeasures. Pentolinium tartrate is rapidly superseding hexamethonium as the hypotensive agent. In essential hypertension it is possible to reduce a patient's diastolic blood pressure from almost any level to 80 mm. Hg for 3 or 4 hours out of 12 on several successive days before the patient leaves hospital. It has not usually been possible to maintain the blood pressure at this level after the patient has left hospital. Nevertheless blood pressure levels achieved with hexamethonium and other drugs can be equalled, and symptomatic relief is the rule. Preliminary two-hourly blood pressure readings are important in deciding the subsequent treatment. After the midday meal there is in ambulant patients a natural drop in the blood pressure that might be mistaken for a therapeutic effect if these control blood pressure readings were not taken. The trial dose of pentolinium tartrate should be only half that at present advised by the makers. Failufe to obtain a response to a trial dose should not deter one from treating with pentolinium tartrate, because a bigger dose usually produces a satisfactory response.

Pathogenesis and Nature of Erythema Nodosum. L.-M. Pautrier. Semaine hôp. Paris **31**:187-190 (Jan. 14) 1955 (In French) [Paris, France].

Erythema nodosum was formerly thought by pediatricians to be exclusively tuberculous in origin; dermatologists, on the other hand, regarded it as a syndrome that might be caused by several factors. Recent studies by Löfgren and other Scandinavian authors seem to show that while in from 50 to 60% of cases it may be considered tuberculous in origin, in the remaining 40 to 50% it is due to such varied factors as infection, especially streptococcic; the use of drugs, especially sulfathiazol; radiotherapy; and exposure to ultraviolet light. These findings not only rule out tuberculosis as the sole cause of erythema nodosum, but they also support the belief long held by Pautrier that erythema nodosum is a polyvalent allergic reaction precipitated by any one of a series of allergens. Further evidence in support of this belief may be found in the histological character of the erythematous lesions, which closely resemble those produced by allergic reaction, especially reactions to such antigens as tuberculin and trichophytin. The uniformity shown by these lesions, regardless of the nature of the intercurrent disease, makes it impossible to regard them as symptomatic of tuberculosis or any of the other conditions to which they have been ascribed. An alternative theory, advanced by Marie, uses the principle of biotropism to explain the appearance of erythema nodosum. Reactivation of a latent germ or virus by an infectious disease would, in this case, lead to the development of a second, autonomous disease accompanying or following the first. Thus herpes, though a distinct disease caused by a specific virus, may appear as the result of reactivation of the virus by pneumococcic or meningococcic infection. The principle of biotropism, however, does not seem to be applicable to erythema nodosum, because it presupposes a specific bacterial or viral cause for the autonomous disease and, in the case of erythema nodosum, no such cause has yet been established.

SURGERY

Primary Bronchogenic Carcinoma of Lung: Statistical Study of 704 Private Patients. J. C. Jones, J. L. Robinson and B. W. Meyer. A. M. A. Arch. Surg. **70**:265-275 (Feb.) 1955 [Chicago].

Jones and associates undertook a study of the private patients with carcinoma of the lung whom they observed over the past 11 years. Not all the diagnoses of primary bronchogenic carcinoma of the lung made or accepted in 704 cases were histologically verified, but in those in whom this was not the case, the clinical evidence has been so overwhelming as to leave little doubt as to its correctness. Surgical experience has failed to demonstrate any improvement in resectability rates over the past 11 years; the rate remains in the vicinity of 20%. Any improvement that has occurred through increased awareness of the disease as a diagnostic possibility has been offset by the delays in diagnosis incident to the use of antibacterial drugs. In about two-thirds of 312 patients having pulmonary resection in an attempt to extirpate the lesion, the disease had already spread through lymph or blood channels prior to surgery, and so these patients eventually died of carcinoma of the lung. The deaths occurred at a rate of about 50% each year of those living at the beginning of the year. Of 64 patients having pulmonary resection previous to 1949 and observed for from 5 to 11 years, 60 survived surgery, 40 died of metastatic carcinoma, 8 died of other causes, and 12 are still living and well 5 to 10 years after surgery. This represents a salvage rate of 31.2% of those patients having a successful operation and should help dispel the belief that carcinoma of the lung is necessarily a fatal disease. When compared with the total number of patients seen with a diagnosis of carcinoma the salvage rate is only 6.3%. Any further improvement must depend chiefly upon getting a higher proportion of patients to surgery before the neoplasm has extended beyond the lung. The authors feel that at present the greatest hope for improvement lies with the general practitioners, who must be depended upon to bring to light early lesions. They should look for it in all male patients over 40. A search for respiratory system symptoms should be a routine part of history-taking in all patients; the use of the chest x-ray should be a routine procedure in physical examination, and adult male patients should be encouraged to have such x-ray examinations twice a year; all abnormal and not easily explainable x-ray shadows in adult male patients should be regarded as possibly neoplastic in origin. If pulmonary infiltrates do not completely disappear in a reasonably short period of antibacterial drug therapy, they should be considered as probably neoplastic. Exploratory thoracotomy should be recommended, if a definite diagnosis is not reached. It is a relatively safe surgical procedure, having a mortality rate of only 0.7%.

Surgical Trends in Pulmonary Tuberculosis. W. S. Conklin. Dis. Chest **27**:147-164 (Feb.) 1955 [Chicago].

Like other workers, Conklin has practically abandoned the use of artificial pneumothorax, phrenemphraxis, and primary thoracoplasty in the treatment of pulmonary tuberculosis. Unilateral or bilateral pulmonary resection is favored in most of the patients who do not manifest adequate resolution of their disease under medical management. The great increase in the number of resections performed by the author resulted largely from the acceptance of the concept of Medlar and co-workers that certain tuberculous lesions, often quite small, may persist as necrotic foci containing viable tubercle bacilli though treated adequately by past standards, and that these foci present a considerable hazard as a potential source of later spread or

exacerbation. Pulmonary resection is preferred to collapse therapy for the following reasons. It is considered to offer a more definitive and permanent means of control. It is generally more conserving of respiratory function. It avoids the late complications of artificial pneumothorax and extrapleural plombage. It generally results in immediate conversion of sputum. Patients usually have a much shorter period of morbidity and can be rehabilitated earlier. Pulmonary resection permits a more rapid hospital turnover, reducing the bed shortage and permitting definitive treatment of a much larger number of patients during a specific period of time. Its wider use will materially reduce the number of readmissions caused by reactivation and spread of disease. Concomitant or preliminary thoracoplasty may be used as an adjunct to resection. In reviewing the trends that the surgical treatment of tuberculosis has shown in his hands and in those of other workers, the author did not attempt to offer statistics concerning the results of treatment, since they would not have much value, as yet, from the standpoint of numbers and of time. He admits that he may be using resection therapy too widely. One may learn that the antimicrobial medicaments now available, and new ones, can obviate the need for much of the surgery that is now performed. One must continually reevaluate the position concerning surgical treatment of pulmonary tuberculosis. In another 10 years one may look back on this heyday of resection as one does now on that of pneumothorax therapy.

Segmental Resection in Pulmonary Tuberculosis. L. D. Eerland and K. K. M. F. Seghers. Dis. Chest **27:**165-178 (Feb.) 1955 [Chicago].

Three hundred simple segmental resections were performed on 179 male and 106 female patients with pulmonary tuberculosis at the Thoracic Center in Groningen, Netherlands, between November, 1949, and August, 1953. Of the 285 patients, 143 were between the ages of 20 and 30 years; the great number of patients of this age group is not remarkable, as resections were done only on quiet tuberculous foci that did not heal with the aid of bed rest and antibiotics. Of the 300 resections, indications consisted of tuberculomas in 44, of caseating foci in 168, of cavities not suitable for nonsurgical collapse therapy in 60, and of cavities with failure of nonsurgical collapse therapy in 28. Preoperative administration of 1 gm. of streptomycin was practiced for one week, and that of 500,000 units of penicillin for one or two days. Streptomycin was given for two to three weeks postoperatively and penicillin for one week after the operation. Postoperative complications were observed in 127 (42.3%) of the 300 segmental resections; most of these complications were benign or transient. Perception deafness occurred in three patients after routine treatment with streptomycin. Two encapsulated empyemas were observed that were cured. Of six diffuse empyemas with bronchopleural fistulas four subsided after thoracoplasty and two are still under treatment after reresection. Reactivation of the pulmonary tuberculosis occurred in 9, and spread in 24 patients. All patients with reactivation are still under treatment. Of the 24 patients with spread of the disease, 11 recovered either after conservative or after supplementary surgical treatment. At the follow-up examination 97.1% of the patients had negative sputums. Results were better in patients with caseating foci and tuberculomas than in those with cavitary processes. The number of patients with negative sputums decreased somewhat with prolonged duration of the follow-up period. More than 90% of the patients operated on resumed their work or will do so in the near future. In nearly 80% of the patients loss of pulmonary function was not greater than was to be expected after segmental resection. Of the 285 patients, 262 (92%) were cured at the time of the reexamination, six months to four years after the resection. Of 23 (8%) still under treatment, the prognosis was doubtful to unfavorable in only 4 (1.4%). The final result of segmental resection was good in 243 (81%) who returned to the useful life of a healthy person with negative sputum; it was moderate in 18, 7 of whom had paralysis of the diaphragm, 5 dyspnea when doing heavier work, and 3 perception deafness; 39 (13%) were failures in that they did not return to the useful life of a healthy person with negative sputum or in that the general or local condition was seriously affected because of complications. There was no postoperative death, and none of the patients died in the course of the follow-up period up to Feb. 1, 1954.

Clinical Experience with Pneumoperitoneum in the Treatment of So-Called Hypertrophic Emphysema. A. L. Banyai and L. H. Hirsh. Dis. Chest **27:**121-127 (Feb.) 1955 [Chicago].

There is no consensus relative to the causation of pseudohypertrophic pulmonary emphysema. According to the authors, the increase in the volume of the lung is not caused by augmented cellular or tissue structure; on the contrary, there is an extensive degenerative process with loss of elastic fibers and destruction of alveoli. Pseudohypertrophic pulmonary emphysema should be differentiated from other forms of pulmonary emphysema, particularly from senile emphysema, which is an involutional condition. One of the cardinal features of pseudohypertrophic pulmonary emphysema is the low position of the diaphragm and functional diaphragmatic insufficiency. Artificial pneumoperitoneum aims at restoring the normal anatomic and physiological status of the diaphragm and thus improving the patient's pulmonary ventilation. The authors found it best to introduce into the peritoneal space 50 cc. of air at a time, testing for sudden increase of intraperitoneal pressure as well as drawing back on the piston of the syringe before proceeding with the next introduction of air. The total amount of air administered with the initial treatment is 500 to 600 cc. Refills of 500 to 600 cc. of air are given at weekly intervals. It is difficult to determine the proper duration of treatment, and each patient must be considered individually. If sufficient muscle tissue remains in the diaphragm and if diaphragmatic function can be reestablished one may facilitate some muscle eutrophy. In such cases patients may be able to abandon pneumoperitoneum after six months. On the other hand, if the diaphragmatic muscle has suffered such atrophy of disuse that muscle eutrophy does not occur, then pneumoperitoneum may have to be maintained indefinitely. One may anticipate most relief when the entire diaphragm is mobilized. Pronounced symptomatic relief, however, is observed when one leaf of the diaphragm remains fixed by adhesions and the other leaf is mobilized with pneumoperitoneum. These patients may complain of abdominal pain caused by stretching of adhesions especially after refill. Such pain is partially relieved by salicylates. Most patients enjoy enough relief of respiratory distress to disregard the abdominal discomfort. Pneumoperitoneum in itself does not represent the complete management of the patient with emphysema. It is necessary to correct circulatory and bronchial disturbances that are part of the disease. In the authors' practice this program was found a safe and useful method of treatment of patients with emphysema. Its use is followed by gratifying subjective and objective results in most patients.

The Problem of Esophageal Atresia. H. J. Oterdoom. Arch. chir. neerl. **6:**229-244 (No. 3) 1954 (In English) [Arnhem, Netherlands].

This paper is one of several reports on esophageal atresia appearing in this issue. Oterdoom reviews the present status of knowledge on several aspects of this condition and his own observations on seven cases. He deplores the fact that many infants still die of congenital atresia because this malformation is not recognized early enough, that is, immediately after birth, when surgical treatment is most likely to be successful, because complicating pneumonia has not as yet developed. The possibility of the existence of this anomaly should be considered whenever pregnancy is associated with hydramnion. It is advisable to use lipiodol (about 0.5 ml.) to demonstrate the atresia, because literature indicates that no child with this disorder has ever survived a barium meal. The best surgical treatment is a direct anastomosis, as performed successfully for the first time by Haight in 1941. Sometimes the operation has to be performed in several stages. The blind pouch is first marsupialized in the cervical region, then a gastrostomy according to Kader is made, and later the proximal esophagus is anastomosed to the stomach. During the preliminary treatment it is important that entrance of saliva and mucus into the trachea be prevented. This is best

done by placing the child in a slight Trendelenburg or the prone position. The use of an oxygen tent is generally necessary in view of existing atelectasis or pneumonia. Antibiotic therapy should be started immediately. The author originally used penicillin and streptomycin, but now excellent results are obtained with oxytetracycline (Terramycin), of which 100 mg. daily is given in three intramuscular doses. Dehydration is controlled by intravenous infusion at the ankle. The infusion should consist mostly of 5% dextrose solution, not isotonic sodium chloride solution. Following operation, gastrostomy is not performed as a routine measure, but a nasal tube is left in situ for about a week; through this the patient can be fed almost immediately after the operation, so that infusion becomes superfluous during the postoperative treatment. Of seven patients treated by the author three survived direct anastomosis, but one of these died of peritonitis following gastrostomy five weeks after the primary operation; another was treated by the multiple-stage technique; two patients died after thoracotomy; and one was left untreated because of multiple atresia.

Treatment of Acute Perforated Peptic Ulcers: Radiological Diagnosis of Site of Perforation. H. D. Moore. Lancet **1**:163-168 (Jan. 22) 1955 [London, England].

Moore reviews observations on 125 patients with acute perforation of a gastric ulcer. Of the 65 who were treated by aspiration 58 recovered; 2, in whom aspiration had been started, were later subjected to suturing; in 2 a subphrenic abscess developed; and 3 died. In the 45 patients subjected to simple suture, the perforation was closed by simple transverse infolding, reinforced with an omental plug, and the peritoneal cavity was cleared of all free fluid. Forty of the 45 patients had an uninterrupted recovery; abscesses developed in 2; 2 died; and in one patient the wound burst, but he recovered after resuture. Partial gastrectomies were done in 15 patients. These patients were selected; they were in good condition, and less than eight hours had elapsed since perforation. There were no deaths in this group of 15 patients. The author feels that fit patients should undergo immediate partial gastrectomy if they have a long previous dyspeptic history, but if they have had little or no previous dyspepsia they should be treated by aspiration. Patients who are ill on admission from the effects of the perforation will die if treated by aspiration or by gastrectomy. The ulcer should be sutured, and they should be given vigorous resuscitative treatment. Those who, on admission, are ill from an associated medical condition should be treated by aspiration. A method is described of outlining the stomach and demonstrating the site of the perforation radiologically. In this method 30 ml. of viscous diodone and 30 ml. of sterile water, or 40 ml. of 35% diodone, is squirted down the suction-tube or is drunk. Three radiographs are then taken: one with the patient erect (this is developed and viewed to see whether the exposure is correct), a second with the patient erect, and the third with the patient supine. This radiological method was used in 19 patients without stomach lesions and in 38 with a perforated peptic ulcer. Of this last group 22 were operated on and 16 were treated by aspiration. Nineteen of the 22 operated on had a duodenal ulcer, and in only 6 of these had the medium passed into the duodenum. In only 7 of the 16 perforations radiographed but not operated on the medium passed into the duodenum, and 4 of these showed the contrast medium escaping through the duodenal hole. This method has not yet been used in enough cases for one to assess its value either in perforations or in other cases, but a good outline of the stomach is so constantly obtained that one should be able to diagnose gastric ulcers with reasonable certainty. Duodenal perforations will occasionally be demonstrated, but a normal finding has no value.

Appendicitis: A Fifteen-Year Survey. E. T. Thieme. A. M. A. Arch. Surg. **70**:207-212 (Feb.) 1955 [Chicago].

This study includes the cases of all patients treated for appendicitis or for whom an appendectomy was done as a primary operation in St. Joseph Mercy Hospital, Ann Arbor, Mich., during the 15-year period commencing in 1935. All operative material was examined by the pathologist. Many surgeons believe that mechanical factors, such as fecaliths and constricting bands, can be the cause of abdominal pain severe enough to warrant emergency surgery. However, the only cases included as proved appendicitis are those in which "suppurative appendicitis with purulent exudate in the lumen and pyogenic infiltration of the wall" were demonstrated in the surgical specimen. This eliminates those reported as catarrhal appendicitis, lymphoid hyperplasia, active chronic appendicitis, mechanical appendicitis, and others. A total of 3,277 patients were treated primarily for appendicitis. Of this total, 36% underwent an interval appendectomy. Of 2,071 patients, 64% were operated on for suppurative appendicitis, but of these, 413 either had no microscopic evidence of suppurative appendicitis or another disease was found. This error in diagnosis was 20.6%. The author feels that this high percentage of error is partly explained by the strict pathological classification, but it sharply divides the proved case from the doubtful case. Because of the present publicity concerning "unnecessary surgery" and "unethical surgical practices," the emergency appendectomy must be carefully scrutinized. The American College of Surgeons has advised that "tissue committees" be formed to investigate the number of "normal appendices" removed as emergencies. A reasonably typical picture has been reported in as low as 61% and as high as 90% of the cases proved to be appendicitis. At the author's hospital, 71% of the group subjected to emergency appendectomy, but in whom the pathological examination did not show suppurative appendicitis, had a reasonably good clinical picture of acute appendicitis. It is in this group that one finds the "Disease X." That disease is characterized by the history of generalized abdominal pain localizing to the right lower quadrant, nausea and vomiting, a well-elevated white blood cell count, slight elevation of temperature, and a normal urine. Physical examination reveals tenderness and spasm in the right lower quadrant. Abdominal exploration reveals no pathological changes. "Disease X" merits consideration in evaluating the error in diagnosis of acute appendicitis. The author also comments on the danger of the missed diagnosis. To further confuse the relationship between the clinical diagnosis and the pathologist's report, 13.7% of those appendixes removed at an interval appendectomy were reported to have "acute suppurative appendicitis." The mortality rate from appendectomy improved in each of the three five year periods, dropping from 2.6% to 1.1% to 0.4%. The latter is considered the irreducible minimum to be expected in any series of major operations. The factors long considered to affect the mortality are only briefly discussed, as the control of infection by the antibiotics is the main factor in this improvement. However, overtreatment and sensitization are now problems. Accurate diagnosis, prompt hospitalization, and good surgical judgment are emphasized again.

GYNECOLOGY & OBSTETRICS

The Place of Sympathectomy in Treatment of Young Married Women. T. P. Grant. J. Obst. & Gynaec. Brit. Emp. **61**:797-803 (Dec.) 1954 [London, England].

Grant points out that, since sympathectomy has become a recognized treatment for some forms of essential hypertension, interest has been aroused among obstetricians concerning the effect of pregnancy on the patient who has had the operation and the effect of the operation on the patient's reproductive capacity. The author presents observations on four women with essential hypertension in whom sympathectomy was done, in one of them during the fourth month of pregnancy. One of these women had been subjected to a subdiaphragmatic (Adson type) splanchnicectomy and lumbar ganglionectomy for malignant hypertension while in the services and had had no previous pregnancies. The other three all fell into the group of cases of essential hypertension with superadded toxemia. Each of these three had Smithwick transdiaphragmatic splanchnicectomy and dorsolumbar ganglionectomy. Seven pregnancies before sympathectomy produced no surviving children in these four women. After operation six pregnancies resulted in a healthy child for all but one of the four patients. One child died shortly after delivery at the 37th week, one died in utero at the 38th week, and only one pregnancy had to be terminated by hysterotomy. Pregnancy must be supervised most carefully in these women.

Normal pregnancy does not seem to influence the underlying hypertensive condition but, if complicated by preeclampsia, the process appears to be accelerated and the prognosis worsened. Immediate termination may minimize these late effects, but on this point more evidence is required. Except for the beneficial effects noted above sympathectomy does not influence the course of pregnancy, the type of labor, or the mode of delivery. In the cases reported cesarean section was chosen because of previous emergency hysterotomies or a history of stillbirth. In Smithwick's series 11 of the 14 deliveries were normal and spontaneous. If in a young woman two pregnancies fail as a result of severe hypertension with preeclampsia, sterilization may be advised. Should she resist this course, sympathectomy should be considered as a form of treatment that may both relieve her condition and allow her to have a child.

Use of Magnesium Ion in Management of Eclamptogenic Toxemias. J. A. Pritchard. Surg., Gynec. & Obst. **100**:131-140 (Feb.) 1955 [Chicago].

Magnesium sulfate for toxemia of pregnancy has been used chiefly in combination with either central depressants such as morphine or the barbiturates or hypotensive drugs such as preparations of veratrum viride. Experiences with such combined therapy have resulted in magnesium sulfate's being highly praised by some yet condemned by others, but the use of such combinations has made it difficult to define the advantages or disadvantages resulting from magnesium sulfate. Since 1951 a study of the advantages of this compound used alone as a therapeutic agent for the management of cases of toxemia of pregnancy has been coupled with a more fundamental investigation of some of the pharmacological properties of the magnesium ion. Women in convulsion from eclampsia received 4 gm. of magnesium sulfate intravenously in a 20% solution in a period of four to five minutes. This was immediately followed by an intramuscular injection of 10 gm. of magnesium sulfate in a 50% solution, one-half the total volume deep in each buttock. Then every four hours, as long as the patellar reflex was present and the four hour urine output was 100 ml. or more, 5 gm. in a 50% solution was injected intramuscularly. This schedule was adhered to until delivery was accomplished and usually for 24 hours after. In cases of preeclampsia the intravenous injection was omitted, otherwise the magnesium sulfate treatment regimen was that described. All doses of magnesium sulfate refer to U. S. P. magnesium sulfate, monohydrate, and not to magnesium sulfate, anhydrous, which contains twice as m ich magnesium as the U. S. P. salt. Two hundred eleven women with preeclampsia or eclampsia were treated with magnesium sulfate. It was found that parenterally administered magnesium sulfate effectively inhibits eclamptic convulsions. Close observance of the patellar reflex before further injections avoids the development of magnesium intoxication. The mechanism by which magnesium prevents eclamptic convulsions remains unknown. It lacks significant hypotensive action. It is believed that in cases of toxemia with severe hypertension it is of value to lower the pressure to moderately hypertensive levels. At the University Hospitals of Cleveland hydralazine given intravenously is being used in conjunction with intramuscularly given magnesium sulfate to lower blood pressure in cases of eclampsia with marked hypertension. Parenterally administered magnesium sulfate is not confined to the extracellular fluid compartment; it freely crosses the placenta but does not enter spinal fluid. Parenterally given magnesium sulfate is excreted solely by the kidneys but does not markedly alter renal plasma flow or glomerular filtration. Hypermagnesemia within the therapeutic range neither inhibits uterine contractions nor significantly depresses the fetus.

The Curability of Regional Lymph Node Metastases in Cancer of the Uterine Cervix. J. B. Graham and R. M. Graham. Surg., Gynec. & Obst. 100:149-155 (Feb.) 1955 [Chicago].

The regional lymph nodes are of critical importance in cancer of the uterine cervix. If they are involved the patient's chance of survival is thought to be materially reduced. Clinical experiences so far suggest that, as a general rule, inoperable metastases in pelvic nodes are no more curable by radiation than by surgery. However, occasional control of massive metastases indicates that at times radiotherapy can be effective, even under adverse circumstances. The authors discuss evidence presented by several observers that suggests that radiotherapy does control the regional node metastasis in cervical cancer in a portion of the patients. How often it does so is not readily apparent, but studies on the vaginal smear offer some help in this regard. Apparently there is a correlation between basal cells, the sensitization response, and positive nodes. The progressive rise in incidence of metastatic nodes as the proportion of basal cells increases, and the drop in cure rate by surgery under the same circumstances, is compatible with the well-known influence of positive nodes on the salvage rate in surgically treated cases, in that the salvage rate drops to about 21% in the presence of regional lymph node metastasis. In some patients the basal cells show a characteristic alteration that is called the sensitization response (SR). These basal cells show a dense, basophilic cytoplasm that is finely vacuolated. If 10% of the benign epithelial cells shows this picture the patient is said to have marked sensitization response; if the incidence is no more than 9% the patient is classified as having poor sensitization response. This phenomenon is called the sensitization response because patients who exhibit it are more likely to be sensitive to irradiation. The authors cite figures on the relationship between sensitization response, the incidence of positive nodes, and the response to radiotherapy and say that if, indeed, untreated patients with marked sensitization response have a 64% incidence of involved regional nodes and if radiotherapy cures 74% of the stage 1 and 2 patients with sensitization response, the conclusion is inescapable that radiotherapy cures more than a third of those with positive nodes. Radical surgery results in a five year cure rate of 20 to 25%. While the effectiveness of radiotherapy may be more difficult to evaluate than that of surgery, there is evidence that suggests that it may actually be superior to surgery as a curative measure in selected patients.

Placental Transmission of Antibiotics. D. Charles. J. Obst. & Gynaec. Brit. Emp. **61**:750-757 (Dec.) 1954 [London, England].

Controlled clinical trials were carried out at the obstetric unit of Hammersmith Hospital in London to obtain evidence regarding the diffusibility of drugs as well as antibiotics across the placenta to the fetus. In women in whom for obstetric reasons artificial rupture of the membranes was performed, the antibiotic chosen was administered between two and six hours before the surgical induction of labor. At the time of the surgical induction samples of liquor amnii and maternal blood were collected. At the time of delivery samples of maternal blood, cord blood, and mucus from the baby's throat were collected. In women subjected to elective cesarean section, the antibiotic under trial was administered before operation, and during surgery samples of liquor amnii, cord blood, and maternal blood were collected. In cases of "prolonged labor," or incoordinate uterine action after the membranes had been ruptured for some hours a vaginal swab was cultured and an antibiotic administered to the mother. At delivery the following specimens were collected: mucus from the baby's throat; maternal blood; and cord blood. It was found that penicillin traverses the placental barrier. It was present in the liquor amnii and the cord blood in therapeutic concentrations. Streptomycin, Chloramphenicol, chlortetracycline (Aureomycin), and oxytetracycline (Terramycin) all are transferred from the maternal to the fetal organism and in therapeutic concentrations. The liquor amnii contained negligible amounts of these substances, and it is concluded that the amniotic membrane has some selective absorptive capacity for penicillin. To obtain the optimum effect of antibiotic therapy in cases of prolonged labor with ruptured membranes, it is essential that in all women in whom the membranes have been ruptured 24 hours high vaginal swabs should be plated. The author feels that the results obtained with the antibiotics are consistent with the works of other investigators, and that there can be no doubt that the placental transmission of antibiotics will lower the perinatal mortality if intrapartum infection is present.

OTOLARYNGOLOGY

Acute Obstruction of Upper Respiratory Tract. D. E. McDowell and W. H. Maloney. A. M. A. Arch. Otolaryng. **61**:29-37 (Jan.) 1955 [Chicago].

McDowell and Maloney review the cases of acute obstruction of the upper respiratory tract that were observed during a five-year period in a 560-bed general hospital. Obstruction due to infection, to neoplasm, to mechanical causes, to trauma, to nerve involvement, and to some unusual causes of obstruction are discussed. Since the majority of patients with acute obstruction of the upper respiratory tract are first seen in the receiving ward of the hospital, it is important that the physician in charge recognize a case of upper respiratory obstruction and that he be prepared to do an emergency tracheotomy. The indrawing of the supraclavicular spaces, the labored inspiration, the stridor, the cyanosis, the rapid weak pulse, the fatigue, and the anxious facies of a patient with obstruction of the upper respiratory tract should be instantly recognized. When these signs are present, tracheotomy, or passage of a bronchoscope or endotracheal tube followed by tracheotomy, must immediately be done to establish an airway. All receiving wards should have available for immediate use a sterile tracheotomy tray. The authors emphasize that in many cases it is easier to first pass a bronchoscope or endotracheal tube to relieve the obstruction and then do an orderly tracheotomy, which is thus much easier, since the accessory muscles of respiration are not being used and the patient is quiet. In many cases the patient will sleep during the tracheotomy because of exhaustion from the previous struggle for air. Cutting down on the bronchoscope protects the tracheoesophageal "party-wall" and prevents the gasp and forward lunge that at times accompany opening the trachea in late cases and that contribute to injury to the "party-wall." One should not use this method unless he is experienced in passing a bronchoscope. The operator should use the method that is most rapid and at which he is most adept. One should err on the side of too early and too many tracheotomies rather than too late and too few.

Intra-Arterial Administration of Penicillin in Treatment of Acute Mastoiditis. S. Nakamura and K. Naganuma. A. M. A. Arch. Otolaryng. **81**:61-66 (Jan.) 1955 [Chicago].

Intra-arterial injection of penicillin aims at obtaining a high concentration of the drug for a sudden attack on the abnormal tissues. Nakamura and Naganuma employed this method on 24 patients with acute mastoiditis. In addition studies were made on 20 rabbits. In the patients with mastoiditis the common carotid artery and the internal jugular vein on the diseased side were surgically exposed to facilitate the injection of penicillin and the taking of blood from the jugular vein. The concentration of penicillin in the blood of the carotid artery, internal jugular vein, cubital vein, and ear discharge was simultaneously measured after the intracarotid injection of penicillin. The rabbits were inoculated by repeated injections (into the tympanic cavity through the eardrum) of 0.2 cc. of hemolytic streptococci or pneumococci in bouillon taken from a patient with acute mastoiditis. These rabbits, which showed severe otitis media about two weeks after the first injection, were used for the experiments. The following points were investigated: (1) the sensitivity to penicillin of the bacteria that caused the acute otitis media; (2) the distribution of penicillin in the ear discharge and in the blood of the internal jugular vein on the diseased side following the injection of different amounts of penicillin; (3) the comparative results with the use of hypertonic dextrose solution and distilled water as solvents; (4) results obtained by intra-arterial injection as compared with the results of intramuscular injection; (5) progression of phagocytosis following injection of penicillin, and (6) clinical results of this treatment. The authors found that the intra-arterial injection procedure was far more effective than the intramuscular injection procedure, particularly for cases of acute mastoiditis with pneumococcus type 3; the intracarotid arterial injection procedure markedly reduced the frequency of mastoid operation. The optimum single dosage of penicillin applied by means of intracarotid arterial injection is 600 units per kilogram of body weight, the interval between the injections being three to six hours. The interval between injections depends on the penicillin sensitivity of the bacteria. The total quantity of penicillin given ranged from 180,000 to 400,000 units, depending on the severity of the disease. Twenty-one patients were cured, one was temporarily improved and then had a recurrence, and two did not react to the treatment and required mastoidectomy. The authors consider intracarotid arterial injection of penicillin as a powerful therapeutic procedure in acute mastoiditis.

Antibiotics in Phlegmonous Laryngitis (Laryngeal Cellulitis). E. Rosenbaum. Brit. M. J. **2**:1453-1455 (Dec. 18) 1954 [London, England].

Rosenbaum cites histories of eight patients with phlegmonous laryngitis who came under his observation in the course of three and one-half years. He suggests that the disease be called "laryngeal cellulitis" or "phlegmonous laryngitis." Laryngeal perichondritis may be a sequel, and rapid invasion through an almost unharmed mucosa may result in perichondritis without the expected preceding laryngeal cellulitis. Severe pain on swallowing may be accompanied by grimacing and earache. Aural pain was present in all cases. Five patients had external tenderness. The diagnosis is dependent on mirror examination. It is very important that the practitioner know how to use the laryngeal mirror for indirect laryngoscopy. Five of the patients improved rapidly during treatment with chlortetracycline, the total dose ranging from 2 to 4.75 gm. The use of chloramphenicol in one case, together with a small amount of chlortetracycline, seemed less effective. Penicillin alone was given to two patients, to one of them because the diagnosis was uncertain. The author believes that in this case the six-day treatment could have been shortened with chlortetracycline. One patient responded quickly to penicillin, but three others did not respond satisfactorily to penicillin injections of between 1,200,000 and 4,400,000 units. In these three patients treatment was continued successfully with chlortetracycline. Submucous invasion of the connective tissue and the deeper layers of the larynx results in edema of the cartilaginous parts. Although symptoms may point toward the right diagnosis, mirror inspection of the larynx is essential. Once diagnosis has been established, chlortetracycline in doses of 250 mg. at six hour intervals appears to be the treatment of choice.

Effect of Vitamin K Compound (Synkayvite) on Computed Blood Loss During Adenotonsillectomy. J. T. King. Ann. Otol. Rhin. & Laryng. **63**:1029-1030 (Dec.) 1954 [St. Louis].

The object of this report is to evaluate the effect of the vitamin K compound, Synkayvite, on the amount of blood lost during the performance of adenotonsillectomy. The effect of vitamin K on bleeding after adenotonsillectomy is not considered here. Blood loss was computed by a special method in 176 children from 2 to 11 years of age upon whom adenotonsillectomy was performed. To each of 85 patients selected at random, 5 mg. of Synkayvite was administered orally three times daily for one week preceding the operation. The remaining group of 91 children did not receive this medication. The same operative technique was used in all cases, and all preoperative medication and preparation were the same in both groups except for the vitamin K compound. The maximum, minimum, and average blood loss were practically the same in the two groups, that is, the preoperative administration of Synkayvite did not significantly affect blood loss during adenotonsillectomy.

UROLOGY

Experiences with Renal Homotransplantation in the Human: Report of Nine Cases. D. M. Hume, J. P. Merrill, B. F. Miller and G. W. Thorn. J. Clin. Invest. **34**:327-382 (Feb.) 1955 [New York].

Some of the nine cases presented in this comprehensive review had been reported on previously. All of the recipients were patients in the terminal stages of severe, advanced renal failure. The risks were fully discussed with the patients and their families and the uncertain outcome made clear. The donor kidneys were obtained from cadavers in six cases, and in two cases the kidneys came from living donors. The homologous

kidney was transplanted into a pocket created in the medial aspect of the upper thigh in eight of the nine cases. In the ninth patient, in whom the transplant was performed at another hospital, the left kidney and spleen of the recipient were removed and anastomoses were made end-to-end between the splenic artery and the renal artery and between the two renal veins. The pelvis of the transplant was anastomosed to the ureter of the recipient, and a T-tube was brought out from the ureter through a stab wound. The patient was readmitted to the Peter Bent Brigham Hospital on the 3rd day and was followed by the authors until his death on the 37th day. Measurable function developed in four of the nine transplants, in that the kidneys secreted urine for from 37 to 180 days. Functional capacity of about 25% of normal may develop in transplants that have been anoxic for from 3 to 3½ hours. A period of anuria beginning either immediately after transplantation or 24 hours later occurred in all transplanted kidneys. The anuria lasted from 8½ to 19 days in the four patients who ultimately showed measurable function. This was felt to be due to the ischemic interval incident to and following transplantation. The ability of the kidney to recover from this anuria has no parallel in animal experiments. The general pathological picture that accompanies homograft failure in the human is qualitatively similar to that seen in experimental animals, but appears much more slowly. Pathological changes were observed in two human renal homotransplants, however, that have not been seen in animal experiments: Severe acute glomerulonephritis developed within 38 days in a homograft performed in a patient with polyarteritis nodosa, and atherosclerosis of intrarenal vessels occurred within 183 days in a homotransplant taken from a patient with mitral and aortic stenosis and placed in a patient with severe hypertension. The disease of the recipient appeared to be able to modify adversely —in the case of polyarteritis nodosa—the course of the transplanted kidney. The question is raised as to whether there is a depressed antibody formation in chronic renal disease that can favorably influence transplant survival by diminishing the host reaction against the transplant. Although autoantibodies against renal tissue are said to be present in the blood of patients with chronic glomerulonephritis, they did not lead to the development of glomerulonephritis in kidneys homografted to patients with this disease. An attempt to reduce the immune response against a renal homograft is described. Corticotropin and cortisone did not appear to exert any pronounced beneficial effect on the survival of human renal transplants. The authors conclude that at the present state of knowledge renal homotransplants do not appear justified in the treatment of human disease.

Progress in Perineal Prostatectomy: Results in 2050 Consecutive Cases. E. Davis and L. W. Lee. Nebraska M. J. **40**:43-51 (Feb.) 1955 [Lincoln, Neb.].

Half a century has elapsed since perineal prostatectomy made its debut, and so Davis and Lee review the developments that have transformed a blind, traumatizing evulsion into a procedure of precision. It is not their aim to advocate any one technique of prostatectomy to the exclusion of others, for they feel that the interests of the patient are best served by careful selection of cases, in clinics where skill by any route is available. They do believe, however, that the advantages of the perineal route are not generally recognized. Of the three available routes of approach to the prostate: the suprapubic (or retropubic), the perineal, and the transurethral, each has its advantages and disadvantages. In an analysis of opinions expressed in personal communications from 100 American urologists of reputation and achievement there were eight resection extremists and exactly the same number declining to avail themselves of the advantages offered by the transurethral route in selected cases. The remaining 84 preferred to fit the operation to the patient. As evidence of their appreciation of the advantages offered by the transurethral route in selected cases, the authors cite the fact that they performed more than 900 transurethral resections. This report is concerned chiefly with 2,050 patients in whom the authors performed perineal prostatectomy over the past 34 years. Good and poor risk cases and all deaths are included in this review. The over-all mortality rate was 2.9%. The authors admit that lower mortality rates have been reported for perineal prostatectomy, but not for series running into four figures. Uncontrollable (and in large percentage unrelated) vascular "accidents" are responsible for approximately half of the deaths. Plastic closure and the newer antibiotics and sulfonamides have contributed largely to the spectacular shortening of postoperative hospitalization. Of the chief causes for concern ordinarly associated with prostatic surgery, hemorrhage, sepsis, fistula, stricture, incontinence, and vascular "accidents," none but the last remains more than a minor problem. Prostatic surgery need not be dreaded but rather welcomed as a means of relief. The patient with residual urine and obstructive symptoms needs but to balance the minimum risk and discomfort of surgical intervention against the increasing risk and suffering and the final inevitable consequence of continued neglect.

Indications for Ureterectomy in the Treatment of Renal Tuberculosis. M. Sulamaa and G. R. Wallgren. Ann. chir. et gynaec. Fenniae (suppl. 5) **43**:430-435, 1954 (In English) [Helsinki, Finland].

Sulamaa and Wallgren present the histories of two boys, aged 8 and 11 years, respectively, who were subjected to nephrectomy on account of renal tuberculosis. The symptoms of cystitis persisted in both patients despite prolonged treatment with streptomycin, *p*-aminosalicylic acid, or Amithiozone. Recovery did not take place until the ureteral stumps were removed 18 months and 3 years, respectively, after the nephrectomies. Histological studies disclosed tuberculous changes in the ureteral stumps. At the time when these patients were admitted, 11 children with urogenital tuberculosis were receiving treatment at the Children's Clinic in Helsinki, Finland. Nephrectomy was performed in 5 of these 11 patients. The authors recommend the radical removal of the ureter in connection with nephrectomy, since the magnitude of the operation is not greatly increased thereby. The presence of a tuberculous focus in the ureteral stump not only presents considerable diagnostic difficulties, it also involves the danger that the tuberculosis might spread to the genitalia and the sound kidney. Conservative treatment in the form of antibiotics and chemotherapeutics does not seem to influence the tuberculous process in the ureteral stump.

Accidental Surgical Transplantation of Carcinoma of Urinary Bladder: A Case Report. L. Weiss and D. P. Bonner. Ann Surg. **141**:278-280 (Feb.) 1955 [Philadelphia].

In a man, aged 60, in whom cystoscopy revealed a large bladder tumor, a cystoprostatoseminal vesiculectomy, combined with bilateral iliac lymph node dissection and bilateral ureterosigmoidostomy was performed through a perineal incision and a U-shaped, transverse lower abdominal incision extending from the right to the left anterior superior iliac spines. The membranous urethra was transected via the perineal incision. The prostate, seminal vesicles, urinary bladder, and regional lymph nodes were removed en bloc without opening the bladder. Three weeks after the operation the midportion of the incision wound began to drain purulent appearing material. Rectal installation of methylene blue failed to demonstrate a fecal fistula. Intravenous injection of indigo carmine failed to appear in the suprapubic wound. About three months after the operation the wound was opened, exposing necrotic tissue at the base. In addition, a tiny nodule was noted at the incision, which grew continuously. Both this nodule and the base of the wound were biopsied and showed carcinoma resembling that in the urinary bladder, except for a slightly better differentiation. The patient became progressively weaker and died. The authors feel that the findings in this case prove the accidental transplantation of a urinary bladder carcinoma into a surgical wound. The sites of the recurrent tumor, especially the small nodule in the far left extremity of the wound, do not suggest spreading by the usual hematogenous or lymphatic routes. The route of escape of these tumor cells was probably via the prostatic urethra when cut across during the operation. From here they spread further into the wound and subsequently grew. Since no autopsy was permitted, the authors did not learn whether the tumor was transplanted also into the pelvis.

THERAPEUTICS

Cancer Chemotherapy. J. C. Bateman. M. Ann. District of Columbia **24**:55-62 (Feb.) 1955 [Washington, D. C.].

Agents that influence the so-called solid malignant neoplasms are here discussed; the lymphomas are responsive to a greater number of chemotherapeutic agents. The literature pertaining to the mustard drugs—methyl bis (beta-chloroethyl) amine, or HN_2; triethylene melamine, or TEM; triethylene phosphoramide, or TEPA; and triethylene thiophosphoramide, or thioTEPA—and 12 other miscellaneous carcinolytic agents is briefly reviewed. In addition, a series of 14 patients with far-advanced cancer is reported on. They were treated with N-3(oxapentamethylene) N'N'' biethylene phosphoramide (ODEPA). This drug is similar in action to thioTEPA but must be used in approximately twice as large a dose. In this group of patients it was administered by routes similar to those used in 99 of the author's patients who were treated with thioTEPA, that is, intramuscularly, intravenously, intra-arterially, intrapleurally, intraperitoneally, intrapericardially, intracranially, and directly into the tumor. The last of these permitted the injection of larger doses (up to 40 mg.) than could be introduced by other methods. About 83% of the patients treated with thioTEPA showed some degree of subjective and/or objective improvement, and the results in the group of 14 patients treated with ODEPA are comparable. In the group of 99, the patients with the best responses were those with carcinoma of the ovary or the central nervous system. In the group of 14, there was one case of melanoma in which some nodules disappeared and no new ones appeared during the five months of treatment. These experiences suggest that the phosphoramides are most effective in adenocarcinoma of the breast and ovary and tumors of the central nervous system and most effective when given locally, especially intrapleurally or into abdominal masses. Mass of tumor is important, since effect on the white blood cell count limits the dose. Drug action is slow; the results are increasingly apparent over many weeks' time. Therapy must be individualized for patient, type of tumor, location of tumor, and extent of disease. The phosphoramides seem to have a promising future in the palliation and control of many types of neoplastic disease. They can greatly simplify cancer therapy because they can be administered in the clinic or office. Observations so far indicate that many patients can be kept active and comfortable indefinitely by careful maintenance therapy.

Is Radioactive Cobalt to be Considered as a Step Forward in Treatment of Carcinoma? H. Schoen, E. Ochs and H. Magnus. Deutsches med. J. **6**:18-23 (Jan. 15) 1955 (In German) [Berlin, Germany].

The question whether the radioactive cobalt is to be considered as a step forward in the treatment of carcinoma is answered affirmatively by the authors. In order to bring the irradiation source close to the tumor, two forms of cobalt 60, namely, Plastobalt (a preparation of the radioactive isotope in a plastic material) and pearls (small balls) have been used by the authors for the last three years at the Central Roentgen Institute of the City Hospitals in Karlsruhe, Germany. Experience is still insufficient to make possible definite recommendations concerning the dosage; one has to rely on the results. Since Plastobalt can be given any desired shape, it can be adjusted easily to the size and form of any cutaneous carcinoma. The frequently ulcerated surface tumor can be equally irradiated in one treatment. The irradiation reaction is mild, epithelization occurs more rapidly, and necroses do not occur. The very hard gamma rays of the radioactive cobalt are absorbed much less by the bone than the soft rays of the Chaoul tube. Consequently, the application of Plastobalt is definitely superior to the other methods of close irradiation of all surface cutaneous carcinomas and particularly those of the face. The same holds true for Plastobalt in the treatment of carcinomas of the oral cavity and tonsils; but there is one disadvantage in that the areas adjacent to the tumor cannot be protected against the irradiation. Undesirable reactions in these areas, however, subside rapidly. The fixation of the Plastobalt corresponding to the location of the tumor depends on the skill of the radiologist. Radioactive cobalt can be used only in the pearl form for treatment of carcinoma of the esophagus. It does not have advantages as compared with the more common methods of irradiation of this type of carcinoma. Plastobalt is recommended for irradiation treatment of carcinoma of the part of the uterine cervix immediately above the vagina; a radium needle is inserted into the cervical canal, while a mold made from Plastobalt is inserted into the crater of the cervix. Plastobalt is definitely superior to radium irradiation in cases in which the carcinoma has invaded the medium third of the vagina. Equal and homogenous irradiation of the diseased tissue, particularly of the important edges on which the carcinoma progresses, may be obtained much better with the Plastobalt than with any radium applicator. Three applications of Plastobalt at intervals of 14 days are usually sufficient for the treatment of carcinoma of the vagina instead of the daily treatment with the Chaoul tube, which causes the patient much discomfort. Plastobalt alone is not sufficient for the treatment of carcinoma of the vulva, which requires after-irradiation with the Chaoul tube to provide the deeper layers with the necessary total dose. Plastobalt did not prove effective in the treatment of carcinoma of the bladder.

Therapy of the Nephrotic Syndrome: Sodium Restriction, Dextran, and Corticotropin (ACTH) Alone or Combined with Nitrogen Mustard. L. Greenman, F. A. Weigand and T. S. Danowski. A. M. A. Am. J. Dis. Child. **89**:169-181 (Feb.) 1955 [Chicago].

Between April, 1951, and December, 1953, 30 children with the nephrotic syndrome were treated at the Children's Hospital in Pittsburgh. Therapy was divided in two phases: (1) the delivery of edema through rigid sodium restriction with or without the administration of dextran (Plavolex), polyvinylpyrrolidone, or urea, and (2) an attempt to correct the renal abnormalities by administration of corticotropin (ACTH) alone or in combination with nitrogen mustard. Of the 30 patients, 28 had generalized edema on admission; 16 of these received dextran or polyvinylpyrrolidone, and diuresis ensued in 12. This was frequently preceded by a disappearance of facial and peripheral edema. Dextran was also given to the two nonedematous patients without change in the body weight. In 10 children with edema unresponsive to or not treated with dextran or polyvinylpyrrolidone, rigid sodium restriction (2 to 9 mEq. of sodium per day for one and one-fourth to four months) was followed by diuresis in 3, with loss of edema in 11 to 16 days. Two patients received urea before corticotropin therapy. Abdominal paracentesis was performed in four patients. No attempt to deliver edema before the institution of corticotropin therapy was made in two others. Five patients were given corticotropin alone, and 25 were given corticotropin and 0.3 mg. of nitrogen mustard per kilogram of body weight, usually on the third day of corticotropin therapy. Corticotropin was given intramuscularly in doses of 25 mg. every six hours for 28 days. Fourteen patients had edema when therapy with the hormone was started. Eleven of the 14 patients had diuresis after one to two weeks of hormone therapy, another lost the excess fluid gradually within four weeks, and two others had diuresis after corticotropin was discontinued. There was rapid subsidence of proteinuria and disappearance of abnormal biochemical findings in most of the patients. Since an equally good response was obtained with corticotropin alone, there is no evidence from the authors' data that any additional benefit was derived from the inclusion of nitrogen mustard in the treatment regimen. The patients were followed up for from one to 24 months. Within the limit of this relatively short period, 22 (73%) of the 30 patients admitted with the nephrotic syndrome were entirely normal, another 4 (13%) were greatly improved and probably normal, and only 4 (13%) were definitely abnormal. Two of the last four were not adequately followed. Corticotropin therapy is obviously associated with delivery of edema. It seems reasonable to suggest that this treatment also favorably alters the course of the illness. Serious hyponatremia is to be avoided. Treatment seems safe when the patients are adequately followed in the hospital. Results seem to be better than those previously achieved, but a much longer follow-up time is needed before conclusions can be drawn about incidence of recovery.

Clinical Use of Potassium Para-Aminosalicylate (KPAS). L. Molthan, R. V. Cohen and C. J. D. Zarafonetis. Am. Rev. Tuberc. **71**:220-227 (Feb.) 1955 [New York].

Potassium *p*-aminosalicylate (KPAS) was administered in the form of a 10% solution, using potable tap water as the solvent, to 64 patients with tuberculosis. The potassium *p*-aminosalicylate used in this trial contained 80% *p*-aminosalicylic acid and 20% potassium. The usual total daily dose was 120 cc. or 12 gm. of potassium *p*-aminosalicylate (9.6 gm. of *p*-aminosalicylic acid). Patients severely ill with tuberculosis were given 150 cc. or 15 gm. of potassium *p*-aminosalicylate (12 gm. of *p*-aminosalicylic acid) daily. Sixty-one (95%) of the 64 patients treated tolerated 12 gm. daily doses of potassium *p*-aminosalicylate without difficulty. There were no evidences of potassium toxicity. Comparative studies of concentration of *p*-aminosalicylic acid on plasma specimens obtained from patients taking potassium *p*-aminosalicylate and from those taking *p*-aminosalicylic acid indicated that potassium *p*-aminosalicylate is more rapidly, and probably more completely, absorbed than is *p*-aminosalicylic acid, and that 12 gm. daily doses of potassium *p*-aminosalicylate produce *p*-aminosalicylate plasma concentrations comparable to those obtained with 12 gm. daily doses of *p*-aminosalicylic acid. From these observations, it is concluded that the administration of potassium *p*-aminosalicylate, in the manner described, offers a superior means of *p*-aminosalicylic acid therapy that carries a high degree of patient tolerance and acceptance.

Experimental Studies on the Treatment of Bone and Joint Tuberculosis with Dihydrostreptomycin and Isonicotinic Acid Hydrazide. F. Bastos Mora and L. Portal Llamedo. J. Bone & Joint Surg. **37-A**:156-168 (Jan.) 1955 [Boston].

Bastos Mora and Portal Llamedo believe that for an experimental study of the treatment of bone and joint tuberculosis it is necessary to produce lesions by direct inoculation in the skeleton. They did this in their experiments and obtained a large number of lesions suitable for testing therapeutic methods. Rabbits and guinea pigs were used in all the experiments. Rabbits are more suitable because of their size, which facilitates both the inoculation and the pathological study of the lesions. Guinea pigs, however, are more sensitive to all kinds of bacilli, even the human strain, which is almost innocuous to rabbits. Moreover, they offer the important advantage of presenting a noticeable lymphatic reaction, which is never observed in rabbits and which offers valuable information about the course of the illness and the effects of treatment. Only male animals were used. Infection of bone was obtained in rabbits by inoculation on the lower end of the femur; 0.05 cc. was injected into the marrow cavity through a small orifice made in the cortex with a special trocar. Thirty days later the first lesions appeared in the infected bone like "wax spots" of a very small size. About the third month these spots conglomerated and in the control animals developed into large caseous foci that filled almost the entire marrow cavity, with softened areas in the center and a strong lymphocytic reaction in the periphery. Infection of joints was produced in the knees of both rabbits and guinea pigs. The emulsion was injected into the synovial fold under the patellar tendon, that is, the infecting organisms were introduced into the synovial tissue, not the joint cavity. It was found that dihydrostreptomycin and isonicotinic acid hydrazide administered in large quantities did not bring about a complete reversal of specific changes, not even when treatment was begun simultaneously with the inoculation. In almost all of the cases treatment proved highly beneficial in respect to progression of the experimental lesions. In all treated animals the lesions were smaller than in the controls and were more sharply demarcated. The drugs appeared to have the greatest influence on the development of the lymphatic lesions. In no instance was there histological evidence of cure or of the development of a productive or cicatricial reaction as the result of treatment. A comparative study of specimens obtained before and after treatment showed that the main action of the drug is to inhibit the spontaneous progressive course of the process. There is little influence on its regression. A comparison between animals treated with dihydrostreptomycin and isonicotinic acid hydrazide in equivalent doses shows almost no difference between the effects obtained with the two drugs.

Actinomycin C (Sanamycin) in Treatment of Malignant Tumors and Lymphogranulomatosis. H. Schmidt, H. Loosen and W. Heinen. Deutsche med. Wchnschr. **80**:140-143 (Jan. 28) 1955 (In German) [Stuttgart, Germany].

At the medical clinic of the University of Cologne, Germany, 30 patients with Hodgkin's disease and various malignant tumors, such as carcinoma of the stomach, cancer of the lungs, lymphosarcoma, fibrosarcoma, seminoma, and hypernephroma, have been treated since 1953 with actinomycin C. Intravenous injections of from 50 to 400 mcg. of the drug were given daily for weeks and even months and side-effects were extremely rare. Inflammation of the mucosa of the mouth, esophagus, and stomach was observed in only three patients, and it subsided in two after temporary discontinuation of therapy. Eight patients with Hodgkin's disease and 12 with various malignant tumors were followed up long enough to permit evaluation of the treatment. In the group of patients with Hodgkin's disease in whom the total dose of the drug varied from 1,675 to 19,000 mcg. and who were followed up for periods of from 5 to 29 months, nearly all showed improved general condition, increase of appetite and body weight, drop in temperature, reduced sedimentation rate, and less anemia. Four also showed definite objective improvement, with regression of swelling of lymph nodes and metastases. Of the 12 patients with various malignant tumors in whom the total dose of the drug varied from 2,400 to 45,000 mcg. and who were followed up for from 3 to 37 months, 10 showed definite subjective improvement and 2 showed regression of metastases. One of these two had been operated on for a hypernephroma, and clinical recovery with complete regression of extensive metastases of the lungs resulted from treatment with actinomycin C. Longer duration of treatment and a larger total dose of the drug seemed to make for better results.

Preoperative Reduction of Bacterial Flora of Colon by Neomycin and Bacitracin. P. Moritsch. Wien. klin. Wchnschr. **67**:53-56 (Jan. 21) 1955 (In German) [Vienna, Austria].

The report by the Danish worker Fog (*J. A. M. A.* **156**:1457 [Dec. 11] 1954) that the intestinal flora is susceptible to neomycin and bacitracin and his recommendation to use a combination of the two drugs orally induced Moritsch to give a therapeutic trial to Nebacetin forte, a proprietary compound, one tablet of which contains 0.25 gm. of neomycin (1 mg. = 200 to 250 units) and 0.25 gm. (12,500 units) of bacitracin. Of 11 patients, two to be subjected to resection for Meckel's diverticulum and nine to be operated on for carcinoma of the rectum, cecum, or sigmoid, four were given orally 1 tablet of this compound three times daily and seven were given 2 tablets three times daily for three days preceding the surgical intervention. In addition they were given daily a cleansing enema and the intestines were washed out with a proprietary solution of the 4-aminobenzenesulfothiocarbamide salt of 4-aminomethylbenzenesulfonamide (Marbadal), since success of treatment depends on thorough evacuation of the intestines. Smears that in the course of the surgical interventions were obtained from the opened small intestine and colon were examined bacteriologically. Of the four patients who received the smaller dose of the compound, the specimens were found to be sterile in one, weak growth of bacillus subtilis was observed in another, and Escherichia coli and micrococci (staphylococci) were found in specimens from the remaining two who had considerable stenosis that probably would have made large doses ineffective. In the specimens of the seven patients who received the double dose of the compound, cocci, enterococci, Esch. coli and Clostridia were absent, but Candida was found in nearly all of them. Esch. coli and enterococci were found in two patients with stenosis and consequently with obstruction by fecal balls that had not been removed by the laxative measures; in cases of this type Fog did not obtain satisfactory results either despite using much larger doses of neomycin and bacitracin. The author believes that a dose of 1.5 gm. of neomycin and of 1.5 gm. of bacitracin daily is adequate in patients without stenosis. He recommends postoperative treatment with penicillin and streptomycin for four to six days. With this management peritonitis or a severer infection of the wound was prevented in all patients. A decrease of ferments or a severe disturbance in the antagonism of the intestinal flora was not observed.

Organ-Specific Chemotherapy of Carcinoma of the Prostate. R. Budniok, H. G. Stoll and G. Altvater. Deutsche med. Wchnschr. **80:**143-146 (Jan. 28) 1955 (In German) [Stuttgart, Germany].

Of 209 ambulatory or hospitalized patients between the ages of 37 and 86 with the clinical diagnosis of carcinoma of the prostate who were treated at the urologic department of the Saint Hedwig Hospital in Berlin, Germany, 65 had increased acid serum phosphatase levels and 144 had normal acid phosphatase levels. Sixty-three patients with increased acid serum phosphatase levels and 71 with normal acid phosphatase levels were treated with diethylstilbestrol diphosphate [ST 52-ASTA Honvan)]. The acid serum phosphatase was determined in every patient before the institution of the treatment. An increased acid serum phosphatase level is the best criterion for the success of treatment. The dose of the drug must be adapted to the patient's individual requirements. Usually 500 mg. of diethylstilbestrol diphosphate was given daily for 10 days; the dose then was reduced to 500 mg. given twice per week. In patients in whom the acid serum phosphatase level was not restored to normal, 500 mg. of the drug was given daily for 10 additional days, and, thus, as a rule, the acid serum phosphatase level could be reduced. With the aid of current control of the acid serum phosphatase level at least at intervals of four weeks, maintenance therapy then was practiced with reduced doses of the drug. The dose of the drug was increased immediately when an increase in the acid serum phosphatase occurred. Normal values of acid serum phosphatase are not an indication for low dosage, because even a metastasizing carcinoma of the prostate need not be associated with an increased acid serum phosphatase level, and treatment with large doses also is the best therapy in the case of a primary tumor without metastasis. In 53 (84%) of the 63 patients with increased acid serum phosphatase levels the acid serum phosphatase was restored to a normal level, while in 10 patients (16%) the increased level of acid serum phosphatase remained unchanged. Clinical improvement with improved general state, disappearance of disturbances of micturition, and diminution in the size of the primary tumor occurred in 64 (90%) of the 71 patients in whom the acid serum phosphatase level had been normal before the institution of the treatment. The amount of residual urine was reduced from 230 cc. before the institution of treatment to 100 cc. in the course of the treatment. Pain from bone metastasis subsided sometimes after five days of treatment. The particular affinity of the diethylstilbestrol diphosphate for the carcinomatous tissue of the prostate is responsible for its cytostatic effect, which in contrast to the estrogen preparations is of great advantage in the so-called hormone-refractory phase. Roentgenologic follow-up for 13 months did not show regression of metastases in the bones, even in patients in whom the acid serum phosphatase showed a good response to the drug. There were no toxic reactions to injections of 2,000 mg. and intravenous drip infusion of 5,000 mg. Swelling of mammary glands was less frequent than with estrogens and subsided in two to three months after withdrawal of the drug.

Atherosclerosis, Potassium Iodide and Lipoid Metabolism. C. D. de Langen. Nederl. tijdschr. geneesk. **98:**3649-3654 (Dec. 11) 1954 (In Dutch) [Haarlem, Netherlands].

Iodine preparations, particularly potassium iodide, were formerly widely used in the treatment of atherosclerosis but are rarely used for this purpose now. Potassium iodide had an almost magic effect on syphilitic gummas. These gummas and other vascular changes caused by syphilis greatly resemble nonsyphilitic atheromatous vascular lesions. The author wondered what might be the effect of potassium iodide on these latter lesions. The author has been interested for years in the influence exerted by potassium iodide on the esterification of cholesterol, on the cholesterolytic capacity of serum, on the phosphatide cholesterol ratio, and on the function of various capillary regions. While in many cases the degree of esterification of cholesterol increased under the influence of potassium iodide, in other cases this did not occur, but although the results were somewhat divergent, animal experiments proved that potassium iodide is the only substance that can prevent, or at least mitigate, the atheromatosis due to a high-cholesterol diet. The author discusses modern views of the development of atheromatosis in connection with his own observations on the effect of potassium iodide on the lipoid metabolism and on the enhanced permeability of the capillaries, together with the bearing that these effects have on the atherosclerotic changes in the vascular walls.

RADIOLOGY

Aneurysmal Bone Cysts. D. C. Dahlin, B. E. Besse, D. G. Pugh and R. K. Ghormley. Radiology **64:**56-65 (Jan.) 1955 [Syracuse, N. Y.].

In a review of the records of more than 2,000 primary bone lesions encountered at operation at the Mayo Clinic in the period 1905-1952, 26 aneurysmal bone cysts were found. The average age of the 26 patients concerned was 17.2 years, with a range of from 5 to 37 years. Sixteen of the patients were female. Of the lesions, 15 were located in the long bones and 5 in the vertebrae, the others being scattered about. There were four main clinical symptoms: 23 patients had pain, 23 swelling, 11 limitation of motion, and 18 tenderness. The pain and tenderness were frequently associated. Usually the pain was not severe but was increased in intensity by exercise. The swelling developed slowly but was progressive. Limitation of motion generally resulted from encroachment on a joint. The duration of symptoms varied from three weeks to three years, with an average of about six months. The results of treatment in this series indicate the benign nature of aneurysmal bone cysts. Follow-up in 24 patients ranged from one to 35 years; 19 were followed for more than 5 years. Sixteen patients were treated by curettage with or without supplementary irradiation, with only one recurrence. Five lesions could be completely excised, and in all these cases cure was obtained. Amputation, performed because of the size of the cysts in one instance and after an erroneous diagnosis of a malignant lesion in two cases, was curative. Aneurysmal bone cysts have a typical roentgenographic appearance in most instances. The pertinent findings include a circumscribed area of rarefaction, and soap-bubble or honeycombed appearance of the interior of the lesion, eccentric bulging of the cortex, which is usually disrupted, a peripheral delimiting thin shell of periosteal new bone, and, in young patients, a location in the diaphysis adjacent to the epihyseal cartilage. In about 16 of the cases reported, the correct diagnosis could have been made preoperatively with reasonable certainty but was not. The diagnosis of aneurysmal bone cyst was made only once, that of giant-cell tumor nine times. The pathological specimens are described. Differentiation from benign giant-cell tumor, hemangioma, fibrous dysplasia, and simple bone cyst can be made from the macroscopic and microscopic features.

Practical Control Measures for Employees Exposed to Ionizing Radiation Hazards: Medical Control. B. R. Nebel. South. M. J. **47:**1147-1149 (Dec.) 1954 [Birmingham, Ala.].

Since inhaled radioactive materials are usually particulate, they are largely entrapped in the hairs of the vestibular space of the nares and the flagellar and mucus-covered surface of the turbinates and the posterior or inner nares. This means that the human nose is an excellent catch basket and filter for particles entering with the air stream. Much of this material can be removed by simple clipping and removal of the hair in the vestibule of the nose, by blowing on the part of the patient, inhaling by mouth, and exhaling vigorously through the nose (as in swimming). Washing is accomplished by having the patient cup his hand and snuff the water into the nasal passage and forcefully expel it by blowing through the external nares, but the patient should be instructed not to swallow the irrigating solution. Vomiting should be induced in patients who have swallowed radioactive material. Drinking a glass of hypertonic salt solution is excellent, and then ipecac and milk may be given. Proper positioning of the patient for vomiting is important in order to avoid aspiration. As regards the treatment of contaminated clothing, hair and skin, the author refers to the "Outline for Decontamination" prepared by the Oak Ridge Medical Department. Proper liaison with local fire departments is advisable at atomic energy installations in locations where these departments might be called in case of fire. Certain sites should be labeled with a placard indicating that water should not be used, since this would spread the danger from radioactive materials.

BOOK REVIEWS

Handbook of Radiology. Editor: Russell H. Morgan, M.D. Professor of Radiology School of Medicine, Johns Hopkins University, Baltimore. Associate editor: Kenneth E. Corrigan, Ph.D., Associate Professor of Radiology, Wayne University, Detroit. Collaborators: Paul C. Aebersold et al. Cloth. $10. Pp. 518, with illustrations. Year Book Publishers, Inc., 200 E. Illinois St., Chicago 11, 1955.

This is an excellent reference book for the radiologist and research worker in radiation science. The quantitative data presented comprise a collection of material from various authoritative sources. Thus the radiotherapist or physicist needs to refer to only this one book in his daily practice. There is also a section on radioactive isotopes. Much of the hitherto unpublished data will serve well to form the basis for new standards. The technique and materials presently used in radiography are also well illustrated in diagrams and tabular form. Because this book is a presentation of established data with little or no explanatory sections, the beginner will probably find himself lost in it.

The Lipids: Their Chemistry and Biochemistry. Volume II: Biochemistry: Digestion, Absorption, Transport and Storage. By Harry J. Deuel, Jr., Dean, Graduate School, and Professor of Biochemistry, University of Southern California, Los Angeles. Cloth. $25. Pp. 919, with illustrations. Interscience Publishers, Inc., 250 Fifth Ave., New York 1; 2a Southampton Row, London, W.C.1, England, 1955.

The proposed two volume series dealing with the chemistry and biochemistry of lipids has now been expanded to three volumes. Volume 1 treated exclusively the chemistry of the lipids and lipid-like materials present in plants and animals. Volume 2 encompasses the available information on the digestion, absorption, transport (in the blood and lymph), and storage of fats and other lipids in the body. Volume 3 will include biosynthesis, metabolism, oxidation, and the nutritional value of lipids. A description of the properties, composition, and behavior of the lipases and lipoxidases as well as the chemistry, structure, and composition of the bile acids are included in volume 2. The main chapter headings are "Digestion and Absorption of Fats in the Gastrointestinal Tract"; "Digestibility of Fats"; "Digestion, Absorption, and Digestibility of Lipids other than Fats"; "Blood Lipids"; "Occurrence of Lipids in the Animal as a Whole"; and "Lipid Distribution in Specific Tissues and in Their Secretions." The text has adequate footnotes with numerous references to the original literature. It includes an author and subject index as well as an index to the plant and animal sources of the lipids mentioned.

A Text-Book of Medicine for Nurses. By E. Noble Chamberlain, M.D., M.Sc., F.R.C.P., Senior Physician, Royal Southern Hospital, Liverpool, England. Oxford medical publications. Sixth edition. Cloth. 30s. Pp. 492, with illustrations. Oxford University Press, 114 Fifth Ave., New York 11; Amen House, Warwick Sq., London, E.C.4, England, 1954.

The fact that this book is in the sixth edition is an indication of the reception of earlier issues. It is not suited to medical students and graduates because of its brevity; however, it is informative for nurses. Those who lecture to nurses should find the book one for recommendation. In addition, there are a number of excellent pictures that should arouse the interest of even the practitioner, although these are not as complete as one would find in books designed for physicians. The volume is attractively prepared and easy to read, and, for the purpose for which it is intended, the index is adequate.

Mosquitoes: Their Bionomics and Relation to Disease. By William R. Horsfall, Associate Professor of Entomology, University of Illinois, Urbana. Cloth. $16. Pp. 723. Ronald Press Company, 15 E. 26th St., New York 10, 1955.

The subtitle to this book indicates its scope. The book contains no keys to the differentiation of species and no illustrations. These can be found elsewhere. It does provide a complete summary on the ecology of all important species of mosquitoes presented according to a set pattern that considers general and local distribution for egg, larva, pupa, and adult forms. Other items considered for one or all of these forms include toxinosis, resistance, movement, development, sensation, feeding, and respiration. It is, therefore, purely a reference manual and as such should be of value for sanitarians, epidemiologists, entomological physiologists, and ecologists. Many useful tables summarize data on the less well-known species. The appendix includes a glossary, a list of techniques covering various aspects of the life of mosquitoes, and a bibliography. This is followed by an index of genera and species that includes even the names of mosquitoes not mentioned in the text. The general index is very brief. It lists Wuchereria bancrofti but not filariasis, Plasmodium but not malaria, and dengue is listed only under virus. As information on species not now included becomes available along with new data on species that are included, subsequent editions will undoubtedly appear.

Porphyrins: Their Biological and Chemical Importance. By A. Vannotti, University Professor and Director of University Medical Polyclinic, Lausanne, Switzerland. Translated by C. Rimington, M.A., Ph.D., D.Sc., Professor of Chemical Pathology in University of London. Cloth. 50s. Pp. 258; xv. Hilger & Watts, Ltd., Hilger Division, 98 St. Pancras Way, London, N.W.1, England, 1954.

The porphyrins are highly important substances found in plants and animals. The most widely spread and best-known representative in the plant world is chlorophyll and in the animal world is probably hemoglobin. This volume is chiefly a discussion of the chemical and biological importance of porphyrins in human beings. Most of the work, therefore, deals with hemoglobin and intracellular hemes, which are important regulators of cell chemistry, but a single chapter briefly covers other porphyrins found in nature. The first two chapters are largely concerned with the chemistry of porphyrins, including their physicochemical characteristics, their extraction, and methods for their qualitative and quantitative determination. A single chapter discusses the biological action of porphyrins, and two chapters are concerned with porphyrin metabolism, both in normal and in certain pathological states. The author has included a lengthy discussion of porphyria, a disease characterized by the formation of excessive quantities of porphyrins. A final chapter covers the treatment of porphyrin diseases. The volume includes a bibliography and a subject index.

The Physics of Viruses. By Ernest C. Pollard. Cloth. $5.50. Pp. 230, with illustrations. Academic Press, Inc., 125 East 23rd Street, New York 10, 1953.

The science of virology has attracted the attention of physicists who perceive in the fundamental nature of viruses a possible means of expressing living things in terms of physics. Using the techniques of modern physics, these investigators have made important contributions to an understanding of the physical properties of viruses. This book, written by a distinguished nuclear physicist, is an account of these contributions. The opening chapter contains a summary of some important properties of viruses. The various techniques of physics—bombardment, absorption of radiation, scattering and diffraction, sedimentation, and diffusion—and their application to virus studies are described. Succeeding chapters present the results obtained with these methods. The size, shape, and hydration of viruses, ionizing radiation, thermal inactivation, virus surface, action of ultraviolet light, sonic and osmotic effects, and virus genetics and multiplication are the topics discussed. Since the language of the book is that of the physicist, it may present a challenge to the virologist who has been chiefly concerned with pathological problems; however, the virologist should familiarize himself with this language in order to keep pace with the developments in his field.

These book reviews have been prepared by competent authorities but do not represent the opinions of any medical or other organization unless specifically so stated.

QUERIES AND MINOR NOTES

SEVERE ANKLE SPRAINS

TO THE EDITOR:—*What is the consensus of opinion on the treatment of severe sprains of the ankle by local infiltration and injection of procaine or by local injection of hydrocortisone (Hydrocortone) acetate? What is the likelihood of formation of thrombi in injured parts due to local instillation of any medicament, particularly the ones mentioned?*

Eugene R. Benedetto, M.D., Alliance, Ohio.

ANSWER.—Treatment of ankle sprains by means of procaine injections was advocated first by Leriche, who proposed this procedure as a primary treatment. Leriche recommended injection of 5 to 10 cc. of 2% procaine solution into the site of maximal tenderness. Immediate analgesia was said to allow the patient to move the joint and walk about without pain. Benefits derived from procaine injection were thought by Leriche to result from interruption of a vicious circle. Nerve stimuli arising at the site of the injury pass to the cord as afferent autonomic impulses; subsequently, autonomic impulses go out to vessels in the neighborhood of the injury, causing them to become dilated and resulting in effusion and outpouring of edema-producing fluid and various metabolites, which in turn set up irritating nerve stimuli, so that the whole process continues. As a result, local reactions at sites of injuries such as sprains, according to Leriche, often are out of proportion to the degree of injury. When the reflex arc is cut by procaine injection, presumably the circle is broken and recovery is accelerated. Whether the reasoning is correct or not, this procedure has many proponents. If this treatment is used, special care should be taken to exclude presence of avulsion of ligaments, dislocation of the joint, and fractures. If all goes well, the procedure can be repeated at intervals of two or three days until the patient is free of symptoms.

No reliable procedure is known for taking a census of current opinion on effectiveness of injecting hydrocortisone acetate into sites of sprains and strains. This procedure, as advocated by Hollander, is without notable risk and is still under study. No information is available about thrombosis occurring in injured parts because of instillations of either procaine or hydrocortisone.

TREATMENT OF PROSTATITIS

TO THE EDITOR:—*What is the accepted treatment of chronic, uncomplicated prostatitis? Is the administration of antibiotics such as chloramphenicol (Chloromycetin), oxytetracycline (Terramycin), and chlortetracycline (Aureomycin) of definite benefit?*

M.D., Illinois.

ANSWER.—The presently accepted treatment of chronic, uncomplicated prostatitis is: (1) search for and elimination of all systemic foci of infection; (2) search for and elimination of all possible foci within the genitourinary tract, with special attention to low-grade, persistent pyelonephritis and its relationship to chronic residual urine in the bladder; and (3) culture and recognition of the presence of invading organisms, identification of the organisms, and, when present, testing their sensitivity to various antibiotics. Stricture of the urethra is a common finding in association with chronic prostatitis and, if present, should be treated and eliminated. Chronic prostatitis is a common condition, and probably 10 or 15% of all men over the age of 45 have it either silently or with varying degrees of manifestations. The development of an acute epididymitis secondary to strain or trauma indicates a silent, long-standing prostatitis. The time-honored treatment in addition to that mentioned is promoting drainage from the prostate by stripping the prostate digitally per rectum. The prostate and seminal vesicles are generally stripped and not vigorously massaged. There are two theories as to the beneficence of this procedure. One is that it opens up the prostatic ducts and provides freer drainage for infected material to get out of the acini of the gland; the second is that there is a local and systemic low-grade immunizing reaction to the procedure, so that it could be considered in some ways similar to an injection of bacterial vaccine.

The exact relationship between the giving of antibiotics and the clinical improvement in the gland is hard to state. It is believed that in some instances the antibiotics are excreted into the gland and the ducts and acini of the prostate and that they have a beneficial effect. However, it is difficult to prove this in a scientific manner. By and large, chronic prostatitis is overtreated after it has been discovered, and one must be very careful not to make the cure worse than the disease. Rough manipulative treatment or the instillation or injection of reactive substances like strong silver nitrate into the posterior urethra are measures that should be outmoded and should now be condemned. One occasionally sees some rather careful work done using chlortetracycline, oxytetracycline, tetracycline (Achromycin), or nitrofurantoin (Furadantin) in groups of patients who had been treated for a considerable period of time for chronic, uncomplicated prostatitis and who were greatly improved following use of these antibiotics in conjunction with sensitivity tests for the specific bacteria found in the nonspecific lesion.

DRUG TREATMENT OF TUBERCULOSIS

TO THE EDITOR:—*What is the best and cheapest drug for use in the treatment of tuberculosis?*

W. L. Garth, M.D., Sonora, Mexico.

ANSWER.—The cheapest of the more effective drugs is perhaps isonicotinic acid hydrazide or isoniazid. It is also the most easily administered and is as free from toxicity as any, although not entirely without some risk, such as a peripheral neuritis. *p*-Aminosalicylic acid (PAS) is also an inexpensive drug and is relatively free from toxic symptoms but is difficult for some patients because of the irritating effect on the gastrointestinal tract. When given as the sodium salt or in alkaline effervescent mixtures there is much less difficulty in tolerating the drug. However, it is not good practice to give any of the drugs alone, because the emergence of bacterial resistance results in about half the time when the drugs are given alone. For an inexpensive yet effective combination, isoniazid and *p*-aminosalicylic acid may be given together. They may also be given without injections, which is perhaps desirable for patients in primitive surroundings. This suggestion does not in any way mean to supplant the use of streptomycin and isoniazid as the combination of choice in panic cases (meningitis, pneumonia, etc.) or the old reliable streptomycin–*p*-aminosalicylic acid combination when facilities will permit its use.

GOVERNMENT-INSPECTED MEAT

TO THE EDITOR:—*Is government-inspected meat inspected for trichinosis, and is it safe to eat government-inspected bacon uncooked?*

Fritz Koenig, M.D., Catlin, Ill.

ANSWER.—According to "Regulations Governing Meat Inspection of the United States" (Bureau of Animal Industry, Agricultural Research Administration, U. S. Department of Agriculture, 1947, p. 99) bacon is classed as a product that is customarily well cooked in the home or elsewhere before being served to the consumer. For that reason processing of this product for the destruction of trichinae is not required. Only meats and meat products whose treatment imparts the appear-

---

The answers here published have been prepared by competent authorities. They do not, however, represent the opinions of any medical or other organization unless specifically so stated in the reply. Anonymous communications and queries on postal cards cannot be answered. Every letter must contain the writer's name and address, but these will be omitted on request.

ance of being cooked, such as hams and sausages, must be handled in such a way as to destroy any possible live trichinae. Meat items that are meant to be eaten without cooking or might be eaten without cooking are treated so as to make them safe for human consumption under specific instructions from the Bureau of Animal Industry. Heat, refrigeration, or a special cure assures the destruction of the parasites, and thus any of these pork products that are obtained from federally inspected dealers may be considered safe from the dangers of infestation. As for eating bacon raw, it might be that the curing of the bacon would assure its harmlessness, but the best opinion is that one should not consume raw or underdone pork. The parasites are easily killed by heat. Pork products that are cooked thoroughly at 137 F are safe from the standpoint of trichinosis.

WHIPLASH INJURIES OF SPINE

TO THE EDITOR:—*Is there a general attitude toward the treatment of whiplash injuries of the cervical spine? What force must be sustained to cause this injury? How long must a patient be followed, and by what methods, to be sure that sequelae will not develop? What are the sequelae and complications to watch for? Must preventive therapy be instituted immediately after the injury? What therapy is considered most effective in avoiding sequelae?*

Harold Wagner, M.D., Chicago.

ANSWER.—The several questions in this inquiry do not permit didactic answers. There are two general attitudes toward the treatment of whiplash injuries of the cervical spine. The practitioner who sees only an occasional whiplash injury tends to ignore the potential sequelae and to procrastinate with regard to treatment. On the other hand, the attitude of the specialist who deals with the late sequelae is one of emphasis on early, careful evaluation, treatment, and reassurance. As has recently been pointed out in THE JOURNAL (**152:**1698-1704 [Aug. 29] 1953), a chronic lesion of the cervical spine is exceedingly difficult to cure, particularly if there is a question of compensation. Emotional factors become increasingly important. The chronic condition develops oftener in women than in men by a ratio of at least 2:1.

The force that is required to produce a whiplash injury varies tremendously according to the direction of the force and the posture of the recipient. Commonly, following a minor collision with one car striking the rear of the other vehicle after it has made a sudden stop, the head of the passenger in the front car will be suddenly whipped backward, possibly from a position of rotation. This may produce a ligament sprain, a temporary subluxation, or a minimal facet fracture. A disk injury may occur.

A patient with this type of injury who shows no abnormal neurological signs should receive continuing reassurance and treatment until full, free neck motion is restored. This stage is often not reached until all compensation problems are settled. The sequelae may be a scalenus syndrome with neuritis and hypesthesia in an arm or hand; chronic myalgia of the long cervical muscles; and, very commonly, headache.

The patient with an obvious injury of this type should receive careful orthopedic and neurological examination of the head, neck, and upper extremities. If there is evidence of nerve root irritation, the patient should be treated immediately with bed rest with light cervical traction for 7 to 10 days. Physical therapy with gentle stretching of the neck should be started within two or three days. If there is recurrence of nerve pain when the patient becomes ambulatory, the physical therapy should be continued, and the patient should be fitted with a cervical collar. Gradually progressive neck exercises should be included in the treatment. A recurrence of muscle spasm, headache, and neurological radiation should be treated with further bed rest and cervical traction. After a period in the hospital, the patient can continue the cervical halter traction each night at home. Properly directed treatment will result in earlier complete cures and will minimize the incidence of chronic neck-shoulder-arm syndromes that are slow to respond to any form of therapy.

USE OF ASCITIC FLUID

TO THE EDITOR:—*Please express an opinion as to the value of giving ascitic fluid (caused by cirrhosis of liver) intravenously for hypoproteinemia.*

Henry J. Konzelmann, M.D., Hillside, N. J.

ANSWER.—The disadvantages in the intravenous use of ascitic fluid from a patient with cirrhosis of the liver in the treatment of hypoproteinemia far outweigh the possible advantages. Such ascitic fluid usually contains between 1% and 2% protein and between 130 and 140 mEq. of sodium per liter. Thus, if a liter a day is given intravenously, only 10 to 20 gm. of protein are furnished—a relatively small amount, although a significant amount for a patient with severe hypoproteinemia. Most patients with hypoproteinemia have disturbances of sodium and water excretion, so that the intake of these two materials must usually be curtailed, particularly that of sodium. Thus, the liter of ascitic fluid given intravenously must be calculated into the fluid intake. The sodium administered represents about 9 gm. of sodium chloride, a large amount for most patients with hypoproteinemia. This amount of sodium daily would usually lead to edema formation in a short time in such a patient. Finally, as ascitic fluid is an excellent culture medium, great care must be taken in this regard, particularly with respect to the tubercle bacillus, as tuberculous peritonitis still is an important complication of cirrhosis. In experimental ascites formation F. W. McKee and collaborators (*J. Exper. Med.* **90:**447 [Nov.] 1949) found that intravenous administration of ascitic fluid caused a marked depression of circulating plasma proteins and a marked increase in ascitic fluid production. Because it is possible to control ascites formation by the use of a rigidly sodium-restricted diet, little ascitic fluid should be available in the future for the use proposed.

ATRESIA OF EXTERNAL AUDITORY CANALS

TO THE EDITOR:—*Is it feasible to do a plastic procedure for the relief of atresia of the external auditory canals, which have become obliterated to the point of obstruction to hearing as the result of a chondritis and perichondritis secondary to an external otitis? This chondritis and perichondritis has extended outward, owing to previous acute inflammatory extensions, so that the entire pinnae are moderately "cauliflower." The external otitis is always active and impossible to control; in fact, the canals cannot be thoroughly dried because of deep canal tenderness. If surgery is recommended, I would appreciate a description of the procedure.*

Edward Russell Roberts, M.D., Bridgeport, Conn.

ANSWER.—A plastic procedure for relief of acquired atresia of the external auditory canals can readily be carried out. The operation consists of making a rather large endaural incision, thereby exposing the mastoid cortex. The mastoid cortex, a sufficient number of mastoid air cells, and the posterior bony ear canal wall down to the area of the bony bridge are removed. The skin of the posterior ear canal wall is then placed posteriorly over the remaining bridge of bone to cover the area of the mastoid antrum. A split skin graft may then be used to fill the remaining portion of the exposed bony cavity. In essence, this procedure constitutes a classical modified radical mastoidectomy in which the bony bridge and ossicles are left undisturbed.

EXERCISE FOLLOWING DELIVERY

TO THE EDITOR:—*How soon after delivery is it safe to have a woman begin doing exercises and knee-chest positions?*

M.D., North Dakota.

ANSWER.—It is safe to have women do postpartum exercises as soon as they will, within roughly 12 to 24 hours after delivery. The same applies to the knee-chest position. Patients should have a good sleep and rest following delivery and then be gotten out of bed several times a day to go to the bathroom and to walk around. On the second morning or day following delivery regular abdominal exercises should be started. The fact that patients get up soon after delivery and frequently thereafter does not mean that they do not need a great deal of rest. The rest periods in bed should be frequent. Since early ambulation has been practiced, this consultant has seen practically no sub-

involution. Because retrodisplacements of the uterus are rather common, and, in a particular case, unless one knows in advance where the uterus was located, one has no way of knowing whether or not it is normally retrodisplaced. A uterus that has become dislodged into the cul de sac will either pull itself up into place as involution occurs or it can be so replaced at the first postpartum visit to the office. In order to prevent a normally placed uterus from becoming retrodisplaced following delivery, one should be sure the uterus is pulled up in the abdomen instead of jammed down into the pelvis. This consultant has used the knee-chest position frequently in women in the past, but now he uses it rarely because it does very little good.

PTYALISM DURING PREGNANCY

To the Editor:—*A patient has marked ptyalism and postnasal drip whenever she is pregnant. Whenever any solid or liquid is consumed, secretion immediately increases so greatly that emesis soon follows. Every known drug has been used to no avail; this has occurred with each of her three pregnancies.*

M.D., New York.

Answer.—There is no satisfactory treatment for the unusual complication of ptyalism during pregnancy. Phenobarbital, ⅛ grain (7.5 mg.) every six hours, may be of benefit in controlling the nervous factor that is almost always present. Swallowing of the excess saliva usually precipitates vomiting. Because fluid loss may be considerable in this syndrome, attention must be directed to replacement. Atropine and related drugs have proved to be of no benefit. The condition usually corrects itself at about the fifth month of pregnancy.

ANOMALOUS RETINAL CORRESPONDENCE

To the Editor:—*Are eccentric fixation and anomalous retinal correspondence one and the same thing? If they are not, what is the difference between them and how does one differentiate them clinically?*

M.D., Pennsylvania.

Answer.—If rays of light strike a retinal area in one eye of an individual he perceives not only light but also is aware of the direction of its origin. If the two foveas of the two eyes are simultaneously stimulated the sensation from the two eyes is superimposed and seems as one. Thus in relation to sensations of direction the two retinas are normally functional counterpoints, and anatomic corresponding areas of the two retinas have a common visual direction. In patients with strabismus there is frequently an adaptive mechanism in which a peripheral retinal element of the deviated eye acquires a common visual direction with the fovea of the fixing eye. Or stated differently, the foveas of the two eyes acquire different visual directions. This condition is known as anomalous retinal correspondence. Roughly speaking, when anomalous correspondence is present there is an incongruity between the objective and subjective angle of deviation. Eccentric fixation may occur in anomalous retinal correspondence in which the defect is so marked that the peripheral retinal elements in the deviated eye maintain fixation even when the opposite eye is covered. Thus there is no macular fixation when the usual fixing eye is covered and the deviated eye stays at its usual angle of deviation. A fine discussion of the various methods of measuring anomalous correspondence and its significance is in the symposium on strabismus, *Transactions of the American Academy of Ophthalmology and Otolaryngology*, March-April, 1953, pages 121-176.

MEASLES AND GAMMA GLOBULIN

To the Editor:—*Should infants and children who have been exposed to measles be given gamma globulin or should they be permitted to develop the disease? These questions were brought up at a recent hospital staff meeting.*

Herbert J. Levine, M.D., Centralia, Ill.

Answer.—A decision in regard to administering gamma globulin should be influenced by several factors. 1. If an infant, regardless of age, has been exposed to measles and the mother has no reliable history of having had the disease, gamma globulin is indicated. 2. If the infant is less than 4 months of age and the mother has had measles, gamma globulin is not necessary because the child should have an inherited immunity at that time that may endure for approximately the first 6 months of life. 3. Between the ages of 4 months and 2 years it is generally considered advisable to prevent measles, because statistics have shown that most deaths from measles occur under 2 years, consequently gamma globulin should be given as soon as possible following exposure. 4. It is generally assumed that everyone is likely to have measles at some period of life, therefore, if the person is more than 2 years of age when exposed and in a good state of health, prevention is not deemed advisable, but modification is desirable. To accomplish the latter, five to six days of the incubative period are allowed to elapse following the exposure before giving gamma globulin. 5. Regardless of age, if the one exposed is suffering from another disease at the time or is in a delicate state of health from any cause the immediate aim should be prevention and gamma globulin should be given at once if the person has never had measles.

IODINE IN IODIZED SALT

To the Editor:—*1. How much iodine is present in ordinary commercial iodized salt? 2. Would enough iodine be ingested by an adult on a routine diet, using iodized salt, to interfere with the validity of a serum protein-bound iodine or a radioactive iodine uptake study? 3. If a radioactive iodine study is done first, will the validity of a serum protein-bound iodine study be impaired if it is done within a few days after the radioactive iodine is given?*

Ephraim M. Katz, M.D., Bronx, N. Y.

Answer.—1. The average content of potassium iodide in iodized salt is 0.01%. 2. With an average intake of 6 gm. of iodized salt daily, about 500 mcg. of iodide would be ingested daily. A single dose of 500 mcg. of iodide given together with radioactive iodine would probably not interfere with the uptake by the thyroid of radioiodine. The continued intake of 6 gm. of iodized salt daily would, however, result in a decreased uptake by the thyroid of radioiodine. Enough iodine would not be ingested by an adult on a routine diet using iodized salt to interfere with the validity of the serum protein-bound iodine test. 3. Since the weight of iodide in a 50 μc. tracer dose is about 0.0004 mcg., of which only a fraction of 1% would be present per liter of blood, the serum protein-bound iodine determination would not be influenced by a tracer dose of radioiodine.

PARALYSIS AGITANS

To the Editor:—*I read in the daily papers that in the United States a specialist performs an operation on patients with postencephalitic paralysis agitans (Parkinsonism) and the patients return to normal life. Please give me all available information.*

S. R. Colmenares, M.D., Leon, Spain.

Answer.—A variety of surgical procedures have been tried in an effort to relieve the tremor and rigidity of paralysis agitans. These procedures have included section of the posterior spinal roots, section of various tracts in the spinal cord, section of the ansa lenticularis, destruction of the head of the caudate nucleus, destruction of portions of the thalamus, and excision of the motor and premotor frontal cortex. Many clinicians believe that none of these procedures has provided sufficient benefit to justify the surgical risk involved. Abolition of tremor or rigidity by these procedures has usually been accomplished only when a reduction in voluntary motor control takes place (Ebin, J.: *Bull. New York Acad. Med.* **27**:653, 1951). More recently, Dr. I. S. Cooper of New York University College of Medicine has reported that occlusion of the anterior chorioidal artery in properly selected patients has been followed by significant alleviation of resting tremor and rigidity in the contralateral extremities. His most favorable results have been noted in patients under 50 years with postencephalitic paralysis agitans who were principally incapacitated by rigidity (Cooper, I. S.: *Surg., Gynec. & Obst.* **99**:207, 1954).

GLYCOSURIA IN SERVICEMEN

To the Editor:—*Finding of a trace of sugar is infrequent in a routine urinalysis performed on healthy servicemen. In a repeat test on these men urine sugar will be absent at a later date and will remain absent on subsequent examination. What is the significance of this finding, and what is the incidence of alimentary glycosuria?* *M.D., Florida.*

Answer.—The incidence and nature of glycosuria in selectees have been carefully studied by Blotner and Hyde (*New England J. Med.* **229:**885-892 [Dec. 9] 1943). They found glycosuria in 367 cases or 0.8% of 45,650 consecutive selectees and volunteers. Of these, 208 proved to have diabetes mellitus, 33 renal glycosuria, and 126 transient glycosuria that was not further classified. A family history of diabetes mellitus was obtained in 9% of those with transient glycosuria, as compared with 5.2% of a large nondiabetic group. In a later study, Blotner (*J. A. M. A.* **131:**1109-1114 [Aug. 3] 1946) found the incidence of glycosuria to be 2% of a group of 69,088 selectees, a surprisingly high figure. Data for "alimentary glycosuria" were not given. These findings and others indicate that even transient glycosuria should never be regarded lightly. Individuals with mild but genuine diabetes mellitus may have sugar in the urine only occasionally. The discovery of any glycosuria should be followed by a determination of the blood sugar two hours after an ordinary meal or by a glucose tolerance test. A level above 140 mg. per 100 cc. of blood two hours after eating strongly suggests diabetes. Values below 100 mg. per 100 cc. eliminate that diagnosis for all practical purposes. Intermediate values call for a glucose tolerance test.

THE T WAVE

To the Editor:—*When is an inverted or flat T wave in lead aVL normal and abnormal?*

Joel W. Salon, M.D., Fort Wayne, Ind.

Answer.—The direction of the T wave in lead aVL cannot be evaluated without reference to the mean electrical axis of the QRS complex. If the QRS complex is of normal duration (no bundle branch block) and the mean electrical QRS axis is horizontal, then the T vector should be upright in lead aVL. If, on the other hand, the mean electrical axis of the QRS complex is vertical, resulting in tall, upright complexes at leads 2, 3, and aVL, then an isoelectric or inverted T wave in lead aVL could be a normal finding.

ARTERIOSCLEROSIS

To the Editor:—*A patient was recently treated elsewhere with antireticular cytotoxic serum, apparently to alter the course of arteriosclerosis. I would appreciate information about this serum.* *Stuart Sanger, M.D., Tucson, Ariz.*

Answer.—Outside of the Soviet Union, there have been no publications, either experimental or clinical, that indicate effectiveness of the antireticular cytotoxic serum (A. C. S.) of Bogomolets in the prevention or treatment of arteriosclerosis in animal or man. Even Bogomolets and his collaborators failed to present adequate evidence of the effectiveness of this agent for the prevention or alleviation of arteriosclerosis or for the prolongation of life, which this serum was supposed to promote.

VITAMIN U

To the Editor:—*Is vitamin U well known or is it the ulcer-healing factor in cabbage juice called vitamin U by Cheney? Is the chemical formula known? Is the ulcer healing factor of cabbage juice isolated? Is it stabilized?*

A. Meinders, M.D., Apeldoorn, Netherlands.

Answer.—Vitamin U is a term that has been applied to the antiulcer factor contained in cabbages and other green vegetables. It apparently promotes the healing of peptic ulcers and may prevent their recurrence. It has not been isolated. The chemical formula is not known and it is not stable. It is readily destroyed by heat and by oxidizing processes. It may represent more than one factor.

HERPES CAUSED BY SUNLIGHT

To the Editor:—*Each year I develop herpes simplex on my first encounter with the sun, whether it be in January or in June. This has occurred for 25 years. What can be done to prevent it? What would be the treatment if it is nonpreventable?* *M.D., Massachusetts.*

Answer.—The application of a good commercial sunscreen preparation or of a cream containing 15% *p*-aminobenzoic acid before exposure to the sun would most likely prevent the development of herpes. If not, it would be well to attempt autovaccination by transferring a drop of clear blister fluid into the skin of an arm. If herpes should develop nevertheless, they should be sponged frequently with 0.5% solution of aluminum subacetate followed by the application of an antibiotic ointment.

PRESCRIPTION FOR PENICILLIN

To the Editor:—*I wish to prescribe 12 oral doses of 250,000 units of penicillin each. The usual liquid preparations on the market cost my patients about $5. The same quantity of injectable procaine penicillin suspension (10 cc. of 300,000 units per cubic centimeter) costs the pharmacist about 45 cents, and, if he dilutes it to 2 oz. (60 cc.) with flavoring and buffering agents, he should be able to give the patient a saving on a prescription for orally given liquid penicillin. Please suggest suitable prescriptions for this use.*

Sam I. Lerman, M.D., Detroit.

Answer.—The following prescription will provide 12 teaspoonful (5 cc.) doses, each containing 250,000 units of penicillin suspended in a pleasing vehicle and suitably buffered.

℞ Procaine penicillin aqueous suspension (300,000 units per cubic centimeter)	10.00
Calcium carbonate	9.00
Syrup of tolu to make	60.00
Label: 1 teaspoonful (5 cc.) as directed.	

The calcium carbonate is for buffering purposes, 0.3 gm. per 100,000 units of penicillin, which is the proportion employed in many commercially available penicillin tablets for oral use. Syrup of tolu is acceptable in taste and slightly alkaline, which might possibly be advantageous. Another vehicle, which is popular because of its chocolate flavor, is syrup of cacao (N. F.); the prescription, compounded with this syrup, would taste very little "like medicine." Storage in the refrigerator, and, of course, the use of a "shake" label, are advisable.

PREVENTION OF RABIES

To the Editor:—*Please discuss briefly Koprowski's antiserum for rabies. Is there any substitute for antirabies vaccine when a person has been bitten by a rabid dog?*

M.D., Indiana.

Answer.—Koprowski's antiserum is made by injecting into a horse large doses of rabies vaccine over a long period of time, producing a high level of antibodies against the rabies virus. This serum is injected intramuscularly into the exposed patient preceding a course of antirabies vaccine. Thus the individual will have antibodies immediately available without having to wait until the rabies vaccine causes him to produce his own immunity. In cases where the animal bite is on or near the face and a short incubation period is expected, the use of Koprowski's antiserum aids in establishing an early immunity. Before injection, the patient should be tested according to the manufacturer's directions for sensitivity to horse serum. There is no completely tested substitute for treatment with antirabies vaccine. Hyperimmune antirabies horse serum has been found to be partly effective in preventing experimentally induced rabies. It should prove of value, therefore, in man, despite its incomplete evaluation. Since hyperimmune serum plus vaccine affords greater protection than either product alone, both products are recommended in severe exposure. Although manufacturers recommend that the usual vaccine treatment should follow the administration of serum, there are those who feel that seven daily injections of vaccine are adequate except where exposure is severe (New York State Department of Health Bulletin, Nov. 29, 1954).